Boehringer Ingelheim

# Protocol for non-interventional studies based on existing data

| | |
|---|---|
| **Document Number:** | **c14336616-01** |
| **BI Study Number:** | 1160.274 |
| **BI Investigational Product(s):** | Pradaxa |
| **Title:** | The Comparative Safety and Effectiveness of dabigatran, versus rivaroxaban, and apixaban Utilized in the Department of Defense (DoD) Non-Valvular Atrial Fibrillation Patient Population-A Retrospective Database Analysis |
| **Protocol version identifier:** | 1.0 |
| **Date of last version of protocol:** | N/A |
| **PASS:** | Yes |
| **EU PAS register number:** | *EUPAS16528* |
| **Active substance:** | *Dabigatran etexilate* |
| **Medicinal product:** | *Pradaxa* |
| **Product reference:** | *N/A* |
| **Procedure number:** | *N/A* |
| **Joint PASS:** | *No* |
| **Research question and objectives:** | To assess the safety and effectiveness of newly initiated dabigatran among patients diagnosed with NVAF in comparison to newly initiated rivaroxaban users and newly initiated apixaban users in two (2) separate study cohorts<br>• dabigatran vs. rivaroxaban |

| | |
|---|---|
| | • dabigatran vs. apixaban |
| **Country(-ies) of study:** | United States |
| **Author(s):** | [redacted] |
| **Marketing authorization holder(s):** | Boehringer Ingelheim International GmbH |
| **MAH contact person:** | Boehringer Ingelheim International GmbH<br>Binger Str. 173<br>D-55216 Ingelheim am Rhein |
| **Date:** | 15Dec2016 |

**Page 1 of 90**

# 1. TABLE OF CONTENTS

# 2. LIST OF ABBREVIATIONS

| | |
|---|---|
| ACE | angiotensin-converting-enzyme inhibitor |
| AE | Adverse Event |
| AF | Atrial Fibrillation |
| ARB | Angiotensin receptor blockers |
| BIPI | Boehringer Ingelheim Pharmaceuticals Inc |
| CDR | Clinical data repository |
| $CHA_2DS_2$-VASc | Congestive heart failure, Hypertension, Age ≥75 years (doubled), Diabetes mellitus, Stroke (doubled), Vascular disease, Age 65–74 years, Sex category |
| $CHADS_2$ | Congestive heart failure, Hypertension, Age ≥75 years, Diabetes mellitus, Prior Stroke or TIA or Thromboembolism |
| CCI | Charlson comorbidity index |
| CI | Confidence Interval |
| COPD | Chronic objective pulmonary disease |
| DEERS | Defense eligibility enrollment reporting system |
| DoD | Department of Defense |
| DRG | Diagnosis-related group |
| [redacted] | [redacted] |
| EMR | electronic medical record |
| ER | emergency room |
| FDA | Federal drug administration |
| FFS | fee-for-service |
| GERD | Gastroesophageal reflux disease |
| GI | Gastrointestinal |
| GIH | gastrointestinal hemorrhage |
| HASBLED | Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile International Normalized Ratio, Elderly, Drugs/alcohol concomitantly |
| HIPAA | health insurance portability and accountability act |
| HIV | Human immunodeficiency virus |

| | |
|---|---|
| HMO | health maintenance organization |
| [redacted] | [redacted] |
| ICD | International classification of diseases |
| ICH | intracerebral hemorrhage |
| IPTW | Inverse probability to weighting |
| IR | Incidence Rate |
| IRB | Institutional Review Board |
| [redacted] | [redacted] |
| KM | Kaplan-Meier |
| MB | Major bleed |
| MDR | Military health system data repository |
| MHS | Military health system |
| [redacted] | [redacted] |
| MTF | military treatment facilities |
| N | Number |
| NDC | National drug code |
| NVAF | Non-valvular Atrial Fibrillation |
| NOAC | Non-Vitamin K antagonist oral anticoagulant |
| NSAID | Non-steroidal anti-inflammatory drug |
| OV | office visit |
| PDTS | Pharmacy data transaction system |
| [redacted] | [redacted] |
| PPI | Proton pump inhibitor |
| PPO | preferred provider organization |
| PSM | Propensity score matching |
| PS | Propensity Score |
| PSTAT | Project Statistician |
| PY | Person-years at risk |

| | |
|---|---|
| RCT | Randomized controlled trial |
| RR | Rate Ratio |
| SD | Standard deviation |
| SAS | Statistical analysis software |
| TIA | transient ischemic attack |
| Tx | Treatment |
| VPN | Virtual private network |
| [redacted] | [redacted] |

# 3. RESPONSIBLE PARTIES

Medical Affairs
[redacted]
Email: [redacted]

Biostatistics
[redacted]
Email: [redacted]

[redacted]
Email: [redacted]

Principal Investigator (DoD)
[redacted]
Email: [redacted]

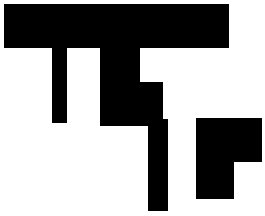
Associate Investigator (DoD)
[redacted]
Email: [redacted]

Senior [redacted], RWE
[redacted]
Email: [redacted]

[redacted], Biostatistics Late Stage
[redacted]
Email: [redacted]

## 4. ABSTRACT

| | | | |
|---|---|---|---|
| **Name of company:** Boehringer Ingelheim | | | |
| **Name of finished medicinal product:** Pradaxa | | | |
| **Name of active ingredient:** dabigatran etexilate | | | |
| **Protocol date:** 15Dec2016 | **Study number:** 1160.274 | **Version/Revision:** 1.0 | **Version/Revision date:** N/A |
| **Title of study:** | The Comparative Safety and Effectiveness of dabigatran, versus rivaroxaban, and apixaban Utilized in the Department of Defense (DoD) Non-Valvular Atrial Fibrillation Patient Population-A Retrospective Database Analysis | | |
| **Rationale and background:** | Due to the emergence of multiple pharmaceutical alternatives to warfarin, physicians in the US are faced with many anticoagulation options. To help inform their decisions physicians want to know the comparative safety and efficacy profiles of these new agents.<br>Now that real world experience with dabigatran for NVAF patients has accrued, the safety and effectiveness for dabigatran, rivaroxaban, and apixaban may also be assessed and compared in this setting.<br>Boehringer Ingelheim Pharmaceuticals Inc. (BIPI) has an opportunity to collaborate with DoD to conduct comparative safety and effectiveness studies of dabigatran, rivaroxaban, and apixaban using already existing real world data from DoD's claims and EMR data. | | |
| **Research question and objectives:** | To assess the safety and effectiveness of newly initiated dabigatran among patients diagnosed with NVAF in comparison to newly initiated rivaroxaban users and newly initiated apixaban users in two (2) separate study cohorts:<br>• dabigatran vs. rivaroxaban<br>• dabigatran vs. apixaban | | |
| **Study design:** | Non-interventional study based on existing data with propensity score matching (PSM) | | |
| **Population:** | NVAF patients, ≥ 18 years of age, enrolled within the DoD Military Health System (MHS) who have newly initiated dabigatran, rivaroxaban or apixaban. Patients must be treatment naïve from OAC use prior to first (index) NOAC. | | |

| | |
|---|---|
| **Variables:** | Covariates<br>• Gender<br>• Age<br>• Geographic location<br>• Health plan type<br>• Baseline comorbid conditions<br>• Pre-index medication use<br>• NOAC prescribing provider type<br>• Baseline Charlson comorbidity index<br>• Baseline stroke risk ($CHADS_2$ and $CHA_2DS_2$-VASc)<br>• Baseline bleeding risk (modified HAS-BLED)<br>• Index exposure<br>• Time to index exposure<br>• Duration of follow-up<br>Primary outcomes<br>• Stroke overall (hemorrhagic, ischemic, uncertain)<br>• Major bleeding, overall<br>Secondary outcomes<br>• Ischemic stroke<br>• Hemorrhagic stroke<br>• Major intracranial bleeding<br>• Major extracranial bleeding<br>o Major GI bleeding<br>o Major other bleeding<br>• TIA<br>• All-cause mortality<br>  |
| **Data sources:** | Military Health System Data Repository (MDR) |
| **Study size:** | Initial study feasibility counts show newly initiated dabigatran among patients diagnosed with NVAF in comparison to newly initiated rivaroxaban users and newly initiated apixaban users in two (2) separate study cohorts:<br>• dabigatran (n= 16,604) vs. rivaroxaban (n=25,215); July 1, 2011 to June 30, 2016<br>• dabigatran (n=6,050) vs. apixaban (n=20,930); December 28, 2012 to June 30, 2016<br>These numbers are based on initial inclusion/exclusion criteria as |

| | |
|---|---|
| | specified above. Additional inclusion/exclusion criteria will reduce population sizes further but feasibility estimates provide strong support for necessary sample size. |
| **Data analysis:** | The target population will include OAC treatment naïve NVAF patients with at least one prescription claim for dabigatran, rivaroxaban or apixaban. For each patient treated with a NOAC, the date of the first NOAC prescription (index exposure) will serve as the index date. Only those patients whose index date occurs between the respective study periods will be included. The 12-month period prior to the index date will be defined as the pre-index period. The patients will be required to have a NVAF diagnosis in the pre-index period (including index date).<br><br>**Study period NOT including pre-index period:**<br>• Dabigatran vs. Rivaroxaban: July 1, 2011 to June 30, 2016<br>• Dabigatran vs. Apixaban: December 28, 2012 to June 30, 2016<br><br>**Study period including pre-index period:**<br>• Dabigatran vs. Rivaroxaban: July 1, 2010 to June 30, 2016<br>• Dabigatran vs. Apixaban: December 28, 2011 to June 30, 2016<br><br>Standard dosing for each NOAC will be used for main analyses. All doses for each NOAC will be combined for a sensitivity analysis. Standard dose for NOAC's:<br>• Dabigatran 150 mg, twice daily, total daily dose of 300 mg<br>• Rivaroxaban 20 mg, once daily, total daily dose of 20 mg<br>• Apixaban 5 mg, twice daily, total daily dose of 10 mg<br><br>**Length of Follow-up:**<br>The post-index follow-up period will begin the day following the NOAC index date and end on whichever of the following occurs earliest:<br>• The day of discontinuation of the index NOAC exposure;<br>• The day before a switch to an anticoagulant different from the index exposure;<br>• The day before a change in dose for the index NOAC;<br>• The end of continuous eligibility of a patient in the health plan (disenrollment);<br>• The end of the study observation period; or<br>• The date of death of the patient.<br>• The last date of calculated days supplied if treatment gap |

| | |
|---|---|
| | >30 days<br>Patients need at least two days of exposure to the index NOAC to ensure they had at least one day of index NOAC exposure in the post-index follow-up period. A sensitivity analysis will also be performed using a 14 day treatment gap.<br><br>Both claims-level data, including diagnosis codes, procedure codes, pharmacy dispensed drugs, cost information, and enrolment data, as well as EHR-level data, including relevant lab tests and results, will be extracted for all applicable patients. Patient demographics, treatment history, and comorbidities, will be derived from the electronic database. Start and stop dates of each course of treatment will be coded from the pharmacy and medical claims data using rules to be developed in the study protocol. Comorbidities of interest will be ascertained through ICD-9 and ICD-10 diagnosis codes, in combination with procedures and medications, as appropriate to the study protocol definitions.<br><br>To account for potential selection bias, the study cohorts (dabigatran/rivaroxaban and dabigatran/apixaban) will be matched on their baseline characteristics using the propensity score matching (PSM) method. The PSM aims to balance the two treatment groups on baseline demographics, health plan type and clinical characteristics. The feasibility of PSM will be evaluated based on available sample size and descriptive results. If patient characteristics between dabigatran/rivaroxaban and dabigatran/apixaban cohorts are significantly different, i.e., less than 50% of patients in the dabigatran group can be matched to the rivaroxaban or apixaban group based on PSM, then the study design will be re-evaluated before proceeding to analysis. The Nearest Neighbor method of propensity score matching within a caliper of 0.10-0.20 (depending on resulting sample sizes) of the standard deviation of the estimated logit will be used to select the matched samples.<br><br>The propensity score models will include baseline variables known to be confounders or factors related to the outcome only, including age, gender, health plan type, geographic region, month and year of index date, Charlson comorbidity index (CCI), stroke risk scores (i.e. $CHADS_2$ or $CHA_2DS_2$-VASc), bleeding risk scores (i.e., modified HAS-BLED), specified comorbid conditions and medication use, based on literature and clinical relevance, as well as empirical data (top diagnoses, procedures, etc.) that may account for possible unforeseen confounding. |

| | |
|---|---|
| | **Descriptive Statistics**<br>Patient characteristics, including demographics, will be reported for NVAF patients treated with dabigatran, rivaroxaban, or apixaban. Stroke risk will be quantified using the $CHADS_2$, $CHA_2DS_2$-VASc score and bleeding risk through the HAS-BLED score Other descriptive variables may include the following:<br><br>**Comorbid conditions at baseline**:<br>• Cancer<br>• Rheumatoid arthritis<br>• Coronary artery disease<br>• Acute myocardial infarction<br>• Cardiomyopathy<br>• Ischemic stroke<br>• Stroke (all types)<br>• TIA<br>• Congestive heart failure<br>• Left ventricular heart failure<br>• Hypertension<br>• Peripheral artery disease<br>• Liver disease<br>• Renal disease<br>• COPD/emphysema<br>• Diabetes<br>• Peptic ulcer (bleeding or non-bleeding)<br>• GERD<br>• Venous thromboembolism<br>• Hyperlipidemia<br>• HIV infection<br>• Bone marrow disease (thrombocytopenia, chronic anemia, myelofibrosis)<br>• Coagulopathy (hemophilia, Von Willebrand disease)<br>• Chronic kidney disease<br><br>**Medication History and Concomitant Use**:<br>• **Non-Oral Anticoagulants**: Number of prescription fills (normalized to a 30-day supply) will be captured during the pre-index period (See Appendix A, Table 8)<br>  ○ Argatroban (can be used in procedures in lieu of heparin)<br>  ○ Unfractionated Heparin (Heparin)<br>  ○ Low Molecular Weight Heparins:<br>  ▪ Enoxaparin<br>  ▪ Tinzaparin |

- Dalteparin
- Fondaparinux

- **Other medication use:** Use of other medications will be determined if patients had ever filled a medication in the following drug classes during the pre-index period (See Appendix A, Table 3, Table 8).
  - Beta blockers
  - Calcium channel blockers
  - Diuretics
  - Other antihypertensives (i.e., angiotensin-converting-enzyme (ACE) inhibitors, combinations)
  - Antihyperlipidemics
  - Corticosteroids
  - Antidiabetics
  - Antiarrhythmics (Amiodarone HCl, Propafenone and Flecainide, Dronedarone, Betapace (Sotalol), Tikosyn, Disopyramide (Norpace), Quinidine)
  - Ketoconazole
  - Antiplatelets (e.g., dypridamole, aspirin, etc.)
  - NSAIDs

**Outcome Analysis**

The follow-up period, which comprises the patient-time denominator, will start at index and will be censored at the first occurrence of either of the following:

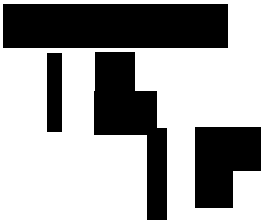
- outcome event
- switch to another anticoagulant
- change in dose of index NOAC
- discontinuation of therapy, as defined as a gap in therapy exceeding 30 days (a 14 day gap sensitivity analysis will also be performed)
- end of DoD eligibility
- end of study period

Primary outcomes

- Stroke overall (hemorrhagic, ischemic, uncertain)
- Major bleeding, overall

Secondary outcomes

- Ischemic stroke
- Hemorrhagic stroke
- Major intracranial bleeding
- Major extracranial bleeding
  - Major GI bleeding
  - Major other bleeding

| | |
|---|---|
| | • TIA<br>• All-cause mortality<br>[redacted]<br>  <br>The first occurrence of each outcome will be identified, separately. For each outcome, event rates and 95% confidence intervals (CI) will be calculated using a person-time approach for each treatment and further stratified by age and gender. Time-to-event analyses (i.e. Kaplan-Meier analysis and Cox proportional hazards model analysis) will be performed for each treatment comparison. Details will be laid out in the protocol and approved by the [redacted]-DoD-BIPI study teams.<br><br>Sensitivity, subgroup and/or exploratory analyses will be performed and may impact changes to the definitions to the assigned cohort, covariates, or outcome. Potential sensitivity/subgroup/exploratory analyses are below:<br><br>[redacted] |
| **Milestones:** | Protocol Completion<br>Data Extraction, Preparation, and QA<br>Data Analysis<br>Develop Final Report |

## 5. AMENDMENTS AND UPDATES

None

## 6. MILESTONES

| **Milestone:** | **Planned date:** |
|---|---|
| Protocol finalization | 02 December 2016 |
| BI Approval | 05 December 2016 |
| Start of data evaluation and specific programming rules development: | 19 October 2016 |
| Start of data analysis: | 05 December 2016 |
| Completion of ACC data analyses- Primary analyses with PSM | 17 January 2016 |
| Completion of data analyses- Secondary analyses with PSM | 31 January 2017 |
| Completion of data analyses-Sensitivity analyses (not including IPTW) with PSM | 14 February 2017 |
| Completion of data analyses-IPTW analyses | 10 March 2017 |
| Final report of study results: | March 2017 |

## 7. RATIONALE AND BACKGROUND

Non-valvular atrial fibrillation (NVAF) is an abnormal heart rhythm characterized by rapid and irregular beating. Patients may experience shortness of breath, palpitations, fainting, or chest pain. Anticoagulants have long been used to decrease the risk of stroke in NVAF patients and the efficacy of blood thinners have been well studied.

Until recently, warfarin, which was FDA-approved in 1954, was the only drug on the market used to prevent stroke in patients with NVAF. In the last few years, the FDA has approved three NOACs – dabigatran, rivaroxaban, and apixaban. All three NOACs have shown efficacy in reducing the overall risk of stroke, but, can also increase the risk for bleeding.

In several clinical trials that included more than 50,000 patients from around the world, studies concluded that all three NOACs were either equivalent to, or more effective than, warfarin in preventing strokes, with an acceptable risk of bleeding.[1-6] NOACs have some advantages, including fewer interactions with food and other drugs, rapid onset, and freedom from the need to have periodic blood test monitoring. Additionally the effects of these drugs wane within a short time frame after they are stopped, a day or so, while the effects of warfarin persist for many days after it is discontinued, potentially causing a slower resolution to bleeding events.

There is still an unmet need to truly understand utilization patterns of NOAC and non-NOAC therapies, as well as outcomes and safety associated with NOACs when compared to one another. Many traditional insurance plans do not allow for lengthy follow-up periods, as patients tend to frequently switch insurance coverage and in some cases providers. Therefore, the ability to assess longitudinal real-world data in a large patient population poses an unmet need in the medical community. The DoD patient population is well suited to help tackle these real-world issues due to its “closed loop system”. DoD beneficiaries have much longer treatment durations and follow-up periods because beneficiaries tend to have longer coverage periods when compared to traditional commercial insurance plans.

DoD, in collaboration with [redacted] have successfully published prior findings in a reputable medical journal comparing dabigatran and warfarin in an NVAF patient population (1). That study aimed to mitigate many of the potential biases and limitations of observational studies via vigorous methodology including inclusion of only newly treated patients, propensity score matching (PSM) to derive cohorts for comparison, and adjustments of covariates if needed based on imbalances left following PSM. Additionally, rules were pre-specified to ensure that PSM analyses of outcomes were only performed if there were enough patients per cohort to support a robust analysis.

The opportunity to expand on our initial study by including additional NOAC usage in a large patient population with a relatively long duration of continuous follow-up provides an outstanding opportunity to assess safety and outcomes in a real-world setting. Results from

our findings may better inform clinical decisions across the DoD and international medical communities.

## 8. RESEARCH QUESTION AND OBJECTIVES

To assess the safety and effectiveness of newly initiated dabigatran among patients diagnosed with NVAF in comparison to newly initiated rivaroxaban users and newly initiated apixaban users in two (2) separate study cohorts:

- dabigatran vs. rivaroxaban
- dabigatran vs. apixaban

# 9. RESEARCH METHODS

## 9.1 STUDY DESIGN

This is a retrospective database cohort analysis of the DoD population.

## 9.2 SETTING

A retrospective cohort study will be conducted using the DoD database. The target population will include OAC treatment naïve NVAF patients with at least one prescription claim for dabigatran, rivaroxaban or apixaban (new oral anticoagulant or NOAC). For each patient treated with a NOAC, the date of the first NOAC prescription (index exposure) will serve as the index date. Only those patients whose index date occurs between the respective study periods will be included. The 12-month period prior to the index date will be defined as the pre-index period. The patients will be required to have a NVAF diagnosis in the pre-index period (including index date). Inclusion and exclusion codes can be found in Appendix B.

**Study period NOT including pre-index period:**

- Dabigatran vs. Rivaroxaban: July 1, 2011 to June 30, 2016
- Dabigatran vs. Apixaban: December 28, 2012 to June 30, 2016

**Study period including pre-index period:**

- Dabigatran vs. Rivaroxaban: July 1, 2010 to June 30, 2016
- Dabigatran vs. Apixaban: December 28, 2011 to June 30, 2016

**NOAC approval dates used for study period determination:**

- Dabigatran (Pradaxa®) – approved October 11, 2010
- Rivaroxaban (Xarelto®) – approved July 1, 2011
- Apixaban (Eliquis®) – approved December 28, 2012

**Subject Inclusion Criteria:**

- Age 18+ on index date
- Patients must have been prescribed either dabigatran, rivaroxaban, or apixaban identified by pharmacy claim during the study period. The first dispensing date of either study drug will be defined as the index date;
- Patients must be treatment naïve from all OAC use prior to the first NOAC prescription, during study period.
- Patients must have at least 12 months of continuous eligibility prior to the index date;
- Patients must have at least one diagnosis code of atrial fibrillation, defined as ICD-9-CM diagnosis of 427.31 or ICD-10-CM diagnosis of I48.0, I48.1, I48.2, I48.91 on the index date or during the pre-index period.

**Subject Exclusion:**

- Less than 12 months of continuous eligibility in the pre-index period
- Any claim for OAC drug (oral use only) in the pre-index period
- Diagnosis of hyperthyroidism during the pre-index period
- Having at least one claim for alternative indications; orthopedic procedures, VTE (includes DVT &PE) and the index NOAC prescription at the same time, or, the alternative indication for anticoagulant occurring within 3 months prior to index date in pre-period Having at least one claim with any of the following diagnoses or procedure codes in order to exclude patients with "transient" causes of Afib (3 months prior to index date in pre-period):
    - Cardiac surgery
    - Pericarditis
    - Myocarditis

- Having at least one medical claim with any of the following diagnoses or procedures codes in order to exclude patients with "valvular" Afib (pre-period):
    - Mitral stenosis
    - Mitral stenosis with insufficiency
    - Mitral valve stenosis and aortic valve stenosis
    - Mitral valve stenosis and aortic valve insufficiency
    - Diseases of other endocardial structures
    - Other and unspecified rheumatic heart diseases
    - Open heart valvuloplasty without replacement
    - Open and other replacement of unspecified heart valve
    - Open and other replacement of aortic valve

- Open and other replacement of mitral valve
- Open and other replacement of pulmonary valve
- Open and other replacement of tricuspid valve
- Heart valve replaced by transplant
- Heart valve replaced by a mechanical device/prosthesis
- Atrioventricular valve repair
- Aortic valve valvuloplasty
- Unlisted procedure, cardiac surgery
- Implantation of catheter-delivered prosthetic aortic heart valve; open thoracic approach
- Transthoracic cardiac exposure (e.g., sternotomy, thoracotomy, subxiphoid) for catheter-delivered aortic valve replacement; without cardiopulmonary bypass
- Transthoracic cardiac exposure (e.g., sternotomy, thoracotomy, subxiphoid) for catheter-delivered aortic valve replacement; with cardiopulmonary bypass
- Replacement, aortic valve, with cardiopulmonary bypass; with prosthetic valve other than homograft or stentless valve
- Valvuloplasty, mitral valve, with cardiopulmonary bypass
- Valvuloplasty, mitral valve, with cardiopulmonary bypass; with prosthetic ring
- Valvuloplasty, mitral valve, with cardiopulmonary bypass; radical reconstruction, with or without ring
- Replacement, mitral valve, with cardiopulmonary bypass
- Implantation of catheter-delivered prosthetic pulmonary valve, endovascular approach
- Replacement, pulmonary valve
- Valvectomy, tricuspid valve, with cardiopulmonary bypass
- Valvuloplasty, tricuspid valve; without ring insertion
- Valvuloplasty, tricuspid valve; with ring insertion
- Replacement, tricuspid valve, with cardiopulmonary bypass

Standard dosing for each NOAC will be used for main analyses. All doses for each NOAC will be combined for a sensitivity analysis. Standard dose for NOAC's include:

- Dabigatran 150 mg, twice daily for total daily dose of 300 mg
- Rivaroxaban 20 mg, once daily for total daily dose of 20 mg
- Apixaban 5 mg, twice daily for total daily dose of 10 mg

**Length of Baseline**

The 12-month period prior to and including the NOAC index date will be defined as the baseline period. Patients will be required to have an NVAF diagnosis during this baseline period.

The pre-index period will serve as a look-back period to measure baseline covariate data and apply other inclusion and exclusion criteria.

**Length of Follow-up:**

The post-index follow-up period will begin the day following the NOAC index date and end on whichever of the following occurs earliest:

- The day of discontinuation of the index NOAC exposure;
- The day before a switch to an anticoagulant different from the index exposure;
- The day before a change in dose for the index NOAC;
- The end of continuous eligibility of a patient in the health plan (disenrollment);
- The end of the study observation period; or
- The date of death of the patient.

Patients need at least two days of exposure to the index NOAC to ensure they had at least one day of index NOAC exposure in the post-index follow-up period.

For patients, index exposure will be considered discontinued if there is a treatment gap longer than the 30 day allowable gap specified from the end of the calculated days supplied. Patients that have treatment gap longer than the specified allowable gap will be censored at that point and follow-up will be discontinued. A sensitivity analysis will also be performed using a 14 day treatment gap.

## 9.3 VARIABLES

### 9.3.1 Exposures

Exposure to NOACs for the purpose of describing the potential study population will be identified by the presence of at least one prescription for dabigatran, rivaroxaban or apixaban. Please refer to Table 1 in Appendix A for the corresponding codes to identify each therapy. As described in Section 9.11 Study Population, the potential study population will be divided into the following two cohorts based on NOAC exposure:

- Dabigatran vs. Rivaroxaban: July 1, 2011 to June 30, 2016
- Dabigatran vs. Apixaban: December 28, 2012 to June 30, 2016

Standard dosing for each NOAC will be used for main analyses. All doses for each NOAC will be combined for a sensitivity analysis.

### 9.3.2 Outcomes

The outcomes will be assessed during the post-index period for the two cohorts. If a patient discontinued the index NOAC or switched to a different NOAC, the outcomes assessment would not continue beyond the date of discontinuation or the switch. The primary and secondary outcomes assessed will be safety and effectiveness measures as described below in in the Outcomes of Interest table. [redacted]

The safety and effectiveness analysis will be conducted for the following cohorts:

- Oral Anticoagulant treatment naive patients: Dabigatran vs. Rivaroxaban
- Oral Anticoagulant treatment naive patients: Dabigatran vs. Apixaban

| Outcomes of Interest | |
|---|---|
| **Primary** | Stroke (hemorrhagic, ischemic, uncertain classification)<br>Major bleeding |
| Secondary | Major bleeding, by the following sites<br>• Major intracranial<br>• Major extracranial<br>  o Major gastrointestinal<br>  o Other<br>Stroke by type<br>• Ischemic stroke<br>• Hemorrhagic stroke<br>Transient ischemic attack (TIA)<br>All-cause mortality |
| Further | [redacted] |

[redacted]

### 9.3.3 Covariates

The following variables, but not limited to, will be used as covariates in the relevant analysis:

- **Gender:** Gender will be determined from eligibility file. Dichotomous variable (male=1, female=0).
- **Age:** Age in years will be determined on the index date. Continuous variable.
- **Geographic location:** Geographic locations of patient residence will be determined from eligibility file and will be grouped based on the US census classification (i.e., Northeast, Midwest, South, and West regions). South region will be the reference location.
- **Health plan type:** Health plan benefit designs such as health maintenance organization (HMO), preferred provider organization (PPO), fee-for-service (FFS), Medicare Advantage and Part D plan, etc. FFS is the reference plan type.
- **Baseline comorbid conditions:** The comorbid conditions will be captured by any inpatient claim, any two physician office visit (OV) or emergency room (ER) visits,

or a combination of both (OV+ER) with a diagnosis of the following conditions in any position during baseline (12 month pre-index period) (See Appendix A, Table 2, for ICD-9-CM) and ICD-10 codes:

- Cancer
- Rheumatoid arthritis
- Coronary artery disease
- Acute myocardial infarction
- Cardiomyopathy
- Ischemic stroke
- Stroke (all types)
- TIA
- Congestive heart failure
- Left ventricular heart failure
- Hypertension
- Peripheral artery disease
- Liver disease
- Renal disease
- COPD/emphysema
- Diabetes
- Peptic ulcer (bleeding or non-bleeding)
- GERD
- Venous thromboembolism
- Hyperlipidemia
- HIV infection
- Bone marrow disease (thrombocytopenia, chronic anemia, myelofibrosis)
- Coagulopathy (hemophilia, Von Willebrand disease)
- Chronic kidney disease

- **Baseline (pre-index) medication use**
  - **Non-Oral Anticoagulants**: Number of prescription fills (normalized to a 30-day supply) will be captured during the pre-index period (See Appendix A, Table 8)
    - Argatroban (can be used in procedures in lieu of heparin)
    - Unfractionated Heparin (Heparin)
    - Low Molecular Weight Heparins:
      - Enoxaparin
      - Tinzaparin
      - Dalteparin
      - Fondaparinux
  - **Other medication use:** Use of other medications will be determined if patients had ever filled a medication in the following drug classes during the pre-index period (See Appendix A, Table 3, Table 8).
    - Beta blockers
    - Calcium channel blockers
    - Diuretics
    - Other antihypertensives (i.e., angiotensin-converting-enzyme (ACE) inhibitors, combinations)

  - Antihyperlipidemics
  - Corticosteroids
  - Antidiabetics
  - Antiarrhythmics (Amiodarone HCl, Propafenone and Flecainide, Dronedarone, Betapace (Sotalol), Tikosyn, Disopyramide (Norpace), Quinidine)
  - Ketoconazole
  - Antiplatelets (e.g., dypridamole, aspirin, etc.)
  - NSAIDs
- **Prescribing provider specialty of NOAC treatment on index date:** The prescribing specialties will include cardiology, pulmonary medicine, hematology, internal medicine, family/general practice, geriatrics, surgery (all types, including vascular surgery), gastroenterology, neurology, emergency medicine, other physician types, other non-physician specialty, unknown.
- **Baseline Charlson comorbidity index (CCI) score**: Baseline CCI measures specific individual comorbidities that are associated with mortality that are observed in the pre-index period. A score will be calculated based on CCI criteria. (See Appendix A, Table 4).
- **Baseline stroke risk**: This will be assessed during 12-month pre-index period using two alternative risk score schemes:

  (1) the $CHADS_2$ stroke risk score is calculated by adding 1 point each for congestive heart failure, hypertension, diabetes, and age >75 years and 2 points for prior stroke or TIA (See Appendix A, Table 5);
  (2) the $CHA_2DS_2$-VASc stroke risk score - calculated by adding 1 point each for congestive heart failure/left ventricle dysfunction, hypertension, diabetes, vascular disease (prior myocardial infarction (MI), peripheral artery disease, or aortic plaque), age between 65-74, female gender, and 2 points for and age >75 years prior stroke or TIA (See Appendix A, Table 6).
- **Baseline bleeding risk**: This will be assessed during the pre-index period using the bleeding score of modified HAS-BLED (See Appendix A, Table 7).
- **Index exposure**: NOAC on the index date
- **Time to index exposure**: The time period in days between the first AF diagnosis observed in the pre-index period and the index date
- **Newly vs. Previously AF diagnosed**: patients with a claim for AF <3 months before the index date will be classified as newly diagnosed. Patients with a claim >3 months before the index date will be classified as previously diagnosed.
- **Duration of follow-up period**: The time period in days between the index date and the end of follow-up.

## 9.4 DATA SOURCES

The study will use the Military Health Systems (MHS) database.

The US DoD operates the largest cradle-to-grave health care database in the US. The military database has over 30 billion archived records, including 5 billion online records spanning

over 11 years for EMRs, 20 years of ePrescribing, and decades of prescription, inpatient, and outpatient data. Its size increases by 230,000 outpatient encounters and 2,700 inpatient admissions every day. As a single-payer, fully budgeted $55 billion health care system, there are uniform medical coverage and pharmacy benefits for the 10 million active people served. The pharmacy benefit in particular has minimal expenses for most patients, thus positioning the DOD as a dynamic platform for patient adherence. It is completely free of expense for patients utilizing military treatment facilities (MTF) and clinics. These data are commercially available only through [redacted].

The MHS provides 2 types of care to its beneficiaries. It provides direct care through a network of over 60 military hospitals and 411 clinics and purchased care provided by civilian providers financed through managed care contracts and fee-for-service reimbursements globally. Direct care accounts for approximately 40% of the total care provided, with the balance being purchased from civilian providers. All the administrative events generated by either a direct care or purchased care inpatient or outpatient encounter are centrally processed into the MDR. Examples of the data recorded in such encounters include patient demographic data, provider information (provider ID, specialty, facility), diagnostic codes (ICD-9 codes for outpatient; diagnosis-related group [DRG] codes for inpatient), and Current Procedural Terminology (CPT) codes for any procedures. Extensive information regarding the patient, including age, race, and gender, is also stored within the MDR via connections with the Defense Eligibility Enrollment Reporting System (DEERS). The military utilizes an electronic medication system called the Pharmacy Data Transaction System (PDTS). All the prescribing details of both direct care and purchased care outpatient medication orders, including mail order, are electronically coded, including the prescribed drug name and NDC, dose, quantity, refills, and prescribing provider. All PDTS information is fed into the MDR.

In addition to feeding data into the MDR, direct care encounters conducted at MTFs utilize the military's EMR system, called AHLTA. This robust EMR system stores the entire encounter electronically and is powered by the MEDCIN® Engine; AHLTA is therefore designed with extensive variables documenting the individual components of an encounter, including symptoms, vital signs, history, physical exams, laboratory and radiology results, diagnostic codes, procedure codes, pharmacy orders, and other orders such as specialty consultation. The AHLTA dataset for each encounter is stored within the Clinical Data Repository (CDR). Aspects of the CDR feed into the MDR, including vitals and lab results. Administrative information such as ICD-9 diagnoses, CPT codes, and pharmacy orders for all direct care encounters are held in common by the CDR and MDR. The CDR is a transactional database required to provide millions of interactions every day for hundreds of thousands of users.

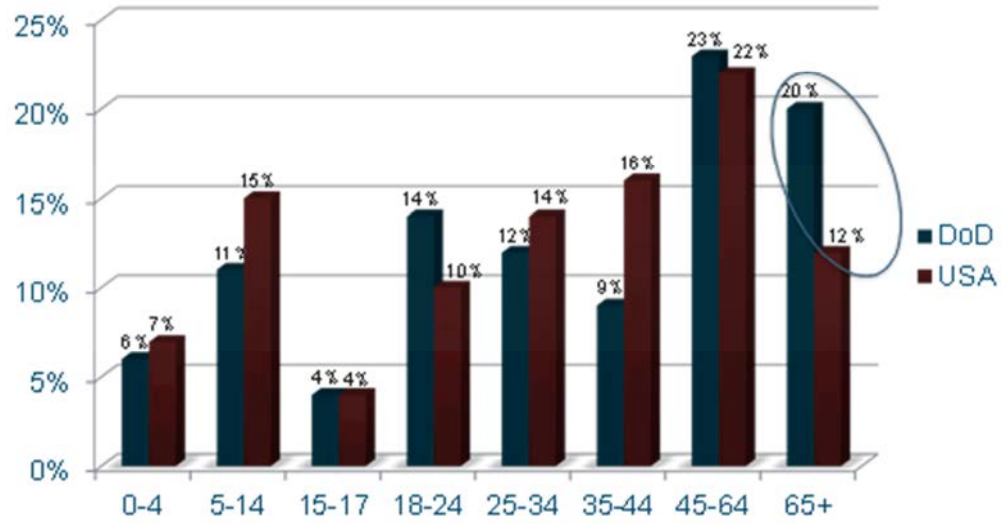



Figure 1 Age distribution among DOD active patients

## 9.5 STUDY SIZE

Given the non-interventional design, the study's objective is not to demonstrate superiority of dabigatran vs. rivaroxaban or apixaban but rather to provide real-world estimates of the comparative effectiveness and safety of dabigatran, rivaroxaban, and apixaban in a large US population of NVAF patients. Therefore, the planned analyses are descriptive in nature and results of the statistical tests are to be interpreted in an exploratory manner.

For each treatment comparison, the available sample size is determined by feasibility assessments of the DoD database according to the pre-specified time window and inclusion/exclusion criteria, and not by formal sample size justifications. Therefore, the purpose of the power assessments described in this section is to illustrate the precision of the effect estimates that can be achieved given the feasible sample size. The primary safety outcome of major bleeding was used for the power assessments, for which an annual event rate of 3.1% for the dabigatran patients and a mean follow-up duration of 0.82 years for both groups were assumed based on the study by Villines et al[6]. In addition, all calculations are based on a two-sided test with $\alpha$=0.05 and a 10% loss of dabigatran patients during the 1:1 propensity score matching.

For the analysis of dabigatran vs. rivaroxaban, it is estimated that a total of approximately 41,000 patients (16,000 dabigatran vs. 25,000 rivaroxaban patients) will be available for this study, based on the proposed time window of July 2011 to March 2016. Power calculations suggest that such a sample size will allow the study to detect a relative difference in the rate of major bleeding of 22% with 80% power, and 25% with 90% power, between the rivaroxaban and dabigatran groups.

For the analysis of dabigatran vs. apixaban, it is estimated that a total of approximately 27,000 patients (6,000 dabigatran and 21,000 apixaban patients) will be available for this study, based on the proposed time window of December 2012 to March 2016. Power calculations suggest that such a sample size will allow the study to detect a relative difference in the rate of major bleeding of 37% with 80% power, and 43% with 90% power, between the apixaban and dabigatran groups. The analysis may therefore have insufficient power to detect a smaller treatment difference if the expected sample size is confirmed.

The actual power of the study will be dependent on the actual event rate in each treatment group, the covariates included in the analysis models, and the actual loss of patients during matching, and may therefore differ.

## 9.6 DATA MANAGEMENT

Access to the DoD data will be through a VPN connection. Through this secure connection [redacted] and [redacted] will construct the study-specific analytic datasets. Data are checked for internal consistency within each patient's claims/records relevant to the study analyses and any patients with extreme or unexpected treatment patterns or diagnoses are identified. BIPI will not have direct access to the raw data. All data management and statistical analyses will be performed using SAS Version 9.4 (or later) in the secured environment

## 9.7 DATA ANALYSIS

All statistical analyses will be performed using SAS version 9.4 (SAS Institute, Cary, NC).

Baseline characteristics will be described for the two cohorts based on the NOAC treatment (dabigatran vs. rivaroxaban and dabigatran vs. apixaban) using standard summary statistics. Means (±standard deviation, SD) and median (interquartile range) will be reported for continuous variables and frequencies (%) for categorical variables. The final study sample will be newly initiating cohorts.

To account for potential selection bias, the study cohorts (dabigatran/rivaroxaban and dabigatran/apixaban) will be matched on their baseline characteristics using the propensity score matching (PSM) method. The PSM aims to balance the two treatment groups on baseline demographics, health plan type and clinical characteristics. The feasibility of PSM will be evaluated based on available sample size and descriptive results. If patient characteristics between dabigatran/rivaroxaban and dabigatran/apixaban cohorts are significantly different, i.e., less than 50% of patients in the dabigatran group can be matched to the rivaroxaban or apixaban group based on PSM, then the study design will be re-evaluated before proceeding to analysis. The Nearest Neighbor method of propensity score matching within a caliper of 0.10-0.20 (depending on resulting sample sizes) of the standard deviation of the estimated logit will be used to select the matched samples.

The propensity score will be defined as the probability of being treated with the index NOAC based on a set of baseline characteristics. If, for example, two patients, one in the dabigatran group and another in the rivaroxaban group, had the same propensity score, they would both have the same probability of being treated with dabigatran. The final list of baseline characteristics to be utilized in the PSM will be decided in conjunction with BI. The following baseline characteristics in the pre-index period will be considered: age, gender, health plan type, geographic region, month and year of index date, Charlson comorbidity index (CCI), stroke risk scores (i.e. $CHADS_2$ or $CHA_2DS_2$-VASc), bleeding risk scores (i.e., modified HAS-BLED), relevant baseline comorbid conditions and medication use as defined in Section 9.3.3. The distribution of baseline characteristics will be presented before and after the matching process. For baseline covariates that are not sufficiently balanced after PSM, the covariates will be included in an appropriate multivariate model to adjust for those differences.

### 9.7.1 Main analysis

Patient demographics and clinical characteristics will be reported for NVAF patients by treatment groups: dabigatran, rivaroxaban, or apixaban. Stroke risk will be quantified using the $CHADS_2$ score, $CHA_2DS_2$-VASc score and bleeding risk through the HAS-BLED score. In addition, administrative variables of eligibility time and post-index follow-up time will be described. Other descriptive variables may include, but are not limited to, the following:

Comorbid conditions at baseline (the 12 month pre-index period), based on diagnosis codes:

- Cancer
- Rheumatoid arthritis
- Coronary artery disease
- Acute myocardial infarction
- Cardiomyopathy
- Ischemic stroke
- Stroke (all types)
- TIA
- Congestive heart failure
- Left ventricular heart failure
- Hypertension
- Peripheral artery disease
- Liver disease
- Renal disease
- COPD/emphysema
- Diabetes
- Peptic ulcer (bleeding or non-bleeding)
- GERD
- Venous thromboembolism
- Hyperlipidemia
- HIV infection

- Bone marrow disease (thrombocytopenia, chronic anemia, myelofibrosis)
- Coagulopathy (hemophilia, Von Willebrand disease)
- Chronic kidney disease

Medication History and Concomitant Use at baseline (the 12 month pre-index period), based on prescription information:

- **Non-Oral Anticoagulants**: Number of prescription fills (normalized to a 30-day supply) will be captured during the pre-index period (See Appendix A, Table 8)
  - Argatroban (can be used in procedures in lieu of heparin)
  - Unfractionated Heparin (Heparin)
  - Low Molecular Weight Heparins:
    - Enoxaparin
    - Tinzaparin
    - Dalteparin
    - Fondaparinux
- **Other medication use:** Use of other medications will be determined if patients had ever filled a medication in the following drug classes during the pre-index period (See Appendix A, Table 3, Table 8).
  - Beta blockers
  - Calcium channel blockers
  - Diuretics
  - Other antihypertensives (i.e., angiotensin-converting-enzyme (ACE) inhibitors, combinations)
  - Antihyperlipidemics
  - Corticosteroids
  - Antidiabetics
  - Antiarrhythmics (Amiodarone HCl, Propafenone and Flecainide, Dronedarone, Betapace (Sotalol), Tikosyn, Disopyramide (Norpace), Quinidine)
  - Ketoconazole
  - Antiplatelets (e.g., dypridamole, aspirin, etc.
  - NSAIDs

The follow-up period, which comprises the patient-time denominator, will start at index and will be censored at the first occurrence of either of the following:

- outcome event
- therapeutic switch
- index NOAC dose change
- discontinuation of therapy, as defined as a gap in therapy exceeding 30 days
- end of DOD eligibility
- end of study period

Patients need at least two days of exposure to the index NOAC to ensure they had at least one day of index NOAC exposure in the post-index follow-up period.

For patients, index exposure will be considered discontinued if there is a treatment gap longer than the 30 day allowable gap specified from the end of the calculated days supplied. Patients that have treatment gap longer than the specified allowable gap will be censored at that point and follow-up will be discontinued. A sensitivity analysis will be performed on patients that have treatment gaps longer than 14 days to determine if an adjustment to the gap days is necessary.

The first occurrence of each outcome will be identified, separately. For each outcome, event rates and 95% confidence intervals (CI) will be calculated using a person-time approach for each treatment and further stratified by age and gender. To compare the occurrence of each outcome between treatments, Kaplan-Meier analysis and Cox proportional hazards model analysis will be performed. Additional adjustments will be made for baseline variables that are not sufficiently balanced after PSM.

Standard dosing for each NOAC will be used for main analyses. All doses for each NOAC will be combined for a sensitivity analysis as defined below.

## 9.8 QUALITY CONTROL

All amendments to the study protocol will be discussed with and agreed upon by the sponsor. Actual amendments to the study protocol will be made by the vendor and sent to BIPI for review and approval. The date of the amendments will be documented on the cover page of the study protocol. Amendments to the protocol will be submitted to the Institutional Review Board (IRB) for review and approval prior to implementation in accordance with regulatory requirements.

Clinicians from two MTFs, who are well versed in the standard of care for the NVAF population in the military setting, will be available to provide oversight and feedback.

## 9.9 LIMITATIONS OF THE RESEARCH METHODS

Similar to other retrospective database studies, this study is subject to limitations including coding errors of omission and commission, incomplete claims, unreliable clinical coding, and unobservable factors not equally distributed in the treatment groups that may also influence the outcomes. In addition, unrecognized confounding due to characteristics not measured or included in the PSM.

## 9.10 OTHER ASPECTS

Ethical Approval:
This study will be conducted using a limited administrative claims database which fully complies with HIPAA. Institutional Review Board and Independent Ethics Committee approvals will be obtained for this study.

## 9.11 BIAS

As for any observational study, there are many potential sources of bias, and there may be significant sources of bias that are not recognized. To minimize bias, this study will include only patients who have not previously been treated with novel oral anticoagulation, and will use propensity score IPTW. Further, effort has been made to avoid exclusions that may differentially affect the treatment groups, and be a potential bias.

# 10. PROTECTION OF HUMAN SUBJECTS

IRB Review and Approval

Upon contracting and once the final protocol has been agreed upon by the client, [redacted] will submit the protocol to an independent IRB review. All protocols including those for purely retrospective studies need to be submitted to the IRB. A request for exemption, expedited or full IRB review will be requested depending on the type of study. Only upon receipt of the IRB exemption or approval letter can the study be initiated. [redacted] will inform the study team once the letter is received, so the study can begin.

# 11. MANAGEMENT AND REPORTING OF ADVERSE EVENTS/ADVERSE REACTIONS

Safety Reporting:

This is a retrospective observational study, in which all patient data will be de-identified and analyzed in aggregate. Individual patient safety related information will not be captured during this study. Thus, individual safety reporting is not applicable for this study.

# 12. PLANS FOR DISSEMINATING AND COMMUNICATING STUDY RESULTS

Ongoing teleconferences with the project team will be conducted to review the project status and results. Ad hoc meetings will be scheduled as needed. A face-to-face meeting to review the results of the study is complete can be scheduled at the client's request.

At the completion of all analyses, [redacted] will develop a full written report, which will describe the research, its results, and the implications of study findings. The report will contain an executive summary as well as detailed description of the methodology, results and conclusions. Study results will be provided in Microsoft Excel spreadsheet table shells and figures as appropriate, with results summarized in a Microsoft Word document. A draft report will be delivered to BIPI followed by a final report once feedback from BIPI is received by [redacted].

An abstract, poster (given abstract acceptance) and manuscript will be developed based on the study results. Abstract(s), poster(s), and/or manuscript(s) related to this study will be completed in accordance to the contractual agreement set forth between [redacted] and BIPI. Publications resulting from this study will comply with recognized ethical standards concerning publications and authorship, including Section II – "Ethical Considerations in the Conduct and Reporting of Research" of the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals,* established by the International Committee of Medical Journal Editors.

# 13. REFERENCES

## 13.1 PUBLISHED REFERENCES

[1] Lip, Gregory Y.H., Larsen, Torben Bjerregaard, Skjoth, Flemming, Rasmussen, Lars Hvilsted. "Indirect Comparisons of New Oral Anticoagulant Drugs for Efficacy and Safety When Used for Stroke Prevention in Atrial Fibrillation." J Am Coll Cardiol. 2012; 60(8): 738-746.

[2] Patel, Manesh R. "Rivaroxaban – Once daily, oral, direct factor Xa inhibition compared with vitamin K antagonism for prevention of stroke and embolism trial in atrial fibrillation: Rationale and design of the ROCKET study." Am Heart Journal. March 2010; 159 (3): 340-347.

[3] Manesh R. Patel, M.D., Kenneth W. Mahaffey, M.D., Jyotsna Garg, M.S., Guohua Pan, Ph.D., Daniel E. Singer, M.D., Werner Hacke, M.D., Ph.D., Günter Breithardt, M.D., Jonathan L. Halperin, M.D., Graeme J. Hankey, M.D., Jonathan P. Piccini, M.D., Richard C. Becker, M.D., Christopher C. Nessel, M.D., John F. Paolini, M.D., Ph.D., Scott D. Berkowitz, M.D., Keith A.A. Fox, M.B., Ch.B., Robert M. Califf, M.D., and the ROCKET AF Steering Committee, for the ROCKET AF Investigators "Rivaroxaban versus Warfarin in Nonvalvular Atrial Fibrillation" N Engl J Med 2011; 365:883-891.

[4] Stuart J. Connolly, M.D., Michael D. Ezekowitz, M.B., Ch.B., D.Phil., Salim Yusuf, F.R.C.P.C., D.Phil., John Eikelboom, M.D., Jonas Oldgren, M.D., Ph.D., Amit Parekh, M.D., Janice Pogue, M.Sc., Paul A. Reilly, Ph.D., Ellison Themeles, B.A., Jeanne Varrone, M.D., Susan Wang, Ph.D., Marco Alings, M.D., Ph.D., Denis Xavier, M.D., Jun Zhu, M.D., Rafael Diaz, M.D., Basil S. Lewis, M.D., Harald Darius, M.D., Hans-Christoph Diener, M.D., Ph.D., Campbell D. Joyner, M.D., Lars Wallentin, M.D., Ph.D., and *the RE-LY Steering Committee and Investigators. "Dabigatran versus Warfarin in Patients with Atrial Fibrillation." N Engl J Med 2009; 361:1139-1151

[5] Christopher B. Granger, M.D., John H. Alexander, M.D., M.H.S., John J.V. McMurray, M.D., Renato D. Lopes, M.D., Ph.D., Elaine M. Hylek, M.D., M.P.H., Michael Hanna, M.D., Hussein R. Al-Khalidi, Ph.D., Jack Ansell, M.D., Dan Atar, M.D., Alvaro Avezum, M.D., Ph.D., M. Cecilia Bahit, M.D., Rafael Diaz, M.D., J. Donald Easton, M.D., Justin A. Ezekowitz, M.B., B.Ch., Greg Flaker, M.D., David Garcia, M.D., Margarida Geraldes, Ph.D., Bernard J. Gersh, M.D., Sergey Golitsyn, M.D., Ph.D., Shinya Goto, M.D., Antonio G. Hermosillo, M.D., Stefan H. Hohnloser, M.D., John Horowitz, M.D., Puneet Mohan, M.D., Ph.D., Petr Jansky, M.D., Basil S. Lewis, M.D., Jose Luis Lopez-Sendon, M.D., Prem Pais, M.D., Alexander Parkhomenko, M.D., Freek W.A. Verheugt, M.D., Ph.D., Jun Zhu, M.D., and Lars Wallentin, M.D., Ph.D., for the ARISTOTLE Committees and Investigators*"Apixaban versus Warfarin in Patients with Atrial Fibrillation." N Engl J Med 2011; 365:981-992.

[6] Thromb Haemost. 2015 Nov 25;114(6):1290-8. doi: 10.1160/TH15-06-0453. Epub 2015 Oct 8

## 13.2 UNPUBLISHED REFERENCES

Not applicable.

# ANNEX 1. LIST OF STAND-ALONE DOCUMENTS

# APPENDIX A. VARIABLE CODING LIST

**Table 1. NOACs for Exposure**

| Class | Description | GPI Code |
|---|---|---|
| Direct thrombin inhibitors | Dabigatran | 833370302001 |
| Direct Xa inhibitor | Rivaroxaban | 83370060 |
| | Apixaban | 83370010 |

**Table 2. Baseline Comorbid Conditions**

| Comorbidity | [redacted] | [redacted] |
|---|---|---|
| Cancer | 140.xx-172.xx, 174.xx-208.xx, 230.xx-231.xx, 233.xx-234.xx | C00.xxx-D49.xxx |
| Rheumatoid arthritis | 714.xx | M05.xxx, M06.xxx, M08.xxx, M12.0xx |
| Multiple sclerosis | 340 | G35 |
| Coronary artery disease | 411.xx, 412.xx, 413.xx, 414.xx, 429.2 | I20.x, I24.x, I25.xxx |
| Acute myocardial infarction | 410.xx | I21.xx |
| Cardiomyopathy | 425.xx | I42.x, I43 |
| Ischemic stroke | 433.x1, 434.x1, 436.x | I63.xxx, I67.89 |
| TIA | 435.x | G45.0, G45.1, G45.2, G45.8, G45.9, G46.0, G46.1, G46.2 |
| Heart failure | 402.x1, 404.x1, 404.x3, 428.xx | I11.0, I13.0, I13.2, I50.1, I50.2x, I50.3x, I50.4x, I50.9 |
| Atrial flutter | 427.32 | I48.92 |
| Hypertension | 401.x, 402.x0, 403.xx, 404.x0, 404.x2, 405.xx | I10, I11.9, I12.x, I13.1x, I15.x, I16.x |
| Peripheral artery disease | 440.xx, 443.xx | I70.xxx, I73.xx, I77.7x, I79.1, I79.8 |
| Liver disease | 121.1, 423.2, 570-573.xx, 751.62 | B661, I311. K70.0-K77, Q446 |
| Renal disease | 580.xx-588.xx, | N0x.x, N08, B52.0, E08.2x, E09.2x, N14.x, N15.x, N17.x, N18.x, N19, N25.0, N25.1, N25.9, N25.81, N25.89, N26.x, |
| | 590.xx-593.xx | N10, N11.x, N12, N13.0, N13.0, N13.1, N13.2, N13.30, N13.39, N13.4, N13.5, N13.6, N13.70, N13.71, N13.732, N13.729, N13.721, N13.731, N13.722, N13.739, N13.8, N13.9, N15.x, N16, N20.x, N22, N28.1, N28.0, N28.81, N28.83, N28.84, N28.85, N28.86, N28.89, N28.9, N29, R80.2 |
| COPD/emphysema | 490-492.xx, 496 | J40.x-J44.x |

| | | |
|---|---|---|
| Hypothyroidism | 243-244.x | E00.x, E01.8, E02, E03.0, E03.1, E03.2, E03.3, E03.4, E03.8, E03.9, E89.0 |
| Diabetes | 250.xx | E10.xxxx, E11.xxxx, E13.xxxx |
| Peptic ulcer/GERD | 530.11, 530.81, 536.2, 536.8, 787.1, 533.xx | K21.x, K27.x, K30, R11.10, R12 |
| Venous thromboembolism | 415.11, 415.19, 451.1x, 451.2, 451.81, 451.83, 451.84, 451.9,453.4x, 453.8x, 453.9 | I2699, I80.1x-I80.9, I82.4xx, I82.6xx, I82.890, I82.90, I82.A1x, I82.B1x, I82.C1x |
| Hyperlipidemia | 272.0 – 272.4 | E78.0x-E78.5 |
| HIV infection | V08, 042, 079.53 | Z21, B20, B97.35 |
| Bone Marrow disease | | |
| Thrombocytopenia | 287.3, 287.4, 287.5 | D69.3, D69.4x, D69.5x, D69.6 |
| Chronic anemia | 285.2 | D63.x |
| Myelofibrosis | 289.83 | D75.81 |
| Coagulopathy | 286.0-286.9, 287.1, 287.3-287.5 | D65-D68.x, D69.1, D69.3-D69.6 |
| Dyspepsia | 536.8 | K30 |
| Left ventricular heart failure | 428.1 | I50.1 |
| Bone marrow disease | 289.9 | D75.9 |
| Thrombocytopenia | 287.5 | D69.6 |
| Anemia | 285.9 | D64.9 |
| Myelofibrosis | 289.83 | D75.81 |
| Coagulopathy (other and unspec) | 286.9 | D68.8, D68.9 |
| Hemophilia | 286.52 | D68.311 |
| Von Willebrand Disease | 286.4 | D68.0 |
| Chronic Kidney Disease (not for Renal disease) | 585.1 | N18.1 |
| | 585.2 | N18.2 |
| | 585.3 | N18.3 |
| | 585.4 | N18.4 |
| | 585.5 | N18.5 |
| | 585.9 | N18.9 |

**Table 3. Medications of Interest (Include antiplatelets from Table 8)**

| **Description** | **GPI codes starting with:** | **GPI 10** |
|---|---|---|

| | | |
|---|---|---|
| Beta blockers | 33 | 3310004510, 3310004512 |
| Calcium channel blockers | 34 | 3400000710, 3400000310, 3400001010, 3400001011, 3400001012, 3400001015, 3400001050, 3400001300, 3400001500, 3400001810, 3400001812, 3400001814, 3400002000, 3400002200, 3400002400, 3400003010 |
| Antihypertensives | 36 | 3610000510, 3610001000, 3610002010, 3610002510, 3610002710, 3610003000, 3610003310, 3610003510, 3610004010, 3610005000, 3610006000, 3615001020, 3615002010, 3615002420, 3615003000, 3615004020, 3615005520, 3615007000, 3615008000, 3617001010, 3620101010, 3620102510, 3620103000, 3620103010, 3620200510, 3620203010, 3620204010, 3620304000, 3625003000, 3630001010, 3630002010, 3630002500, 3640001010, 3640002000, 3640004010, 3640203010, 3660002010, 3699150220, 3699150223, 3699150270, 3699180215, 3699180225, 3699180235, 3699180240, 3699180255, 3699180260, 3699180265, 3699200210, 3699200213, 3699200220, 3699200230, 3699200240, 3699270250, 3699300205, 3699300210, 3699300270, 3699400210, 3699400220, 3699400225, 3699400230, 3699400245, 3699400250, 3699400260, 3699400270, 3699450320, 3699450345, 3699500220, 3699500270, 3699600215, 3699670210, 3699680320, 3699850250, 3699880260 |
| Diuretics | 37 | 3710001000, 3710001010, 3710002000, 3710003000, 3720001000, 3720002000, 3720002010, 3720003000, 3720008000, 3740001000, 3740003000, 3750001010, 3750002000, 3750003000, 3760001000, 3760002000, 3760002010, 3760002500, 3760004000, 3760005000, 3760005500, 3760006000, 3790003000, 3799000210, 3799000220, 3799000230, 3799200410 |
| Antihyperlipidemics | 39 | 3910001000, 3910001010, 3910001610, 3910002010, 3920000600, 3920002400, 3920002500, 3920002510, 3920003000, 3930003000, 3935001000, 3935002000, 3940001010, 3940003010, 3940005000, 3940005810, 3940006010, 3940006510, 3940007500, 3940990225, 3940990245, 3940990270, 3945005000, 3948005020, 3950003510, 3950004010, 3950004520, 3950005500, 3999400220, 3999400230, 3999900250 |
| Corticosteroids | 22 | 2210001000, 2210001020, 2210001200, 2210001510, 2210002000, 2210002010, 2210002020, 2210002500, 2210002540, 2210003000, 2210003010, 2210003020, 2210004000, 2210004010, 2210004020, 2210004500, 2210005010, 2210005020, 2210005022, 2210005030, 2210990210, 2210990215, 2210990258, 2210990260, 2210990262, 2210990263, 2210990265, 2210990285, 2210990287, 2210990290, 2210990308, 2210990310, 2210990315, 2210990320, 2210990350, 2210990360, 2210990370, 2210990373, 2210990420, 2220003010 |

| | | |
|---|---|---|
| Antidiabetics | 27 | 2710400200, 2710400300, 2710400400, 2710400500, 2710400600, 2710400700, 2710401000, 2710402000, 2710407000, 2710408000, 2710409000, 2715005010, 2717001000, 2717001500, 2717002000, 2717005000, 2720002000, 2720002700, 2720003000, 2720004000, 2720004010, 2720005000, 2720006000, 2725005000, 2728004000, 2728006000, 2730001010, 2730001015, 2730002000, 2730003000, 2730405000, 2730990240, 2750001000, 2750005000, 2755001010, 2755005000, 2755006510, 2755007010, 2757402010, 2760705010, 2760706010, 2770002000, 2770004020, 2770005000, 2799250210, 2799250240, 2799250260, 2799250270, 2799300270, 2799400210, 2799500270, 2799600220, 2799600230, 2799600240, 2799650230, 2799700235, 2799700240, 2799780240, 2799780260, 2799800240, 2799800260, 2799900250 |
| Antiarrhythmics: | | |
| Amiodarone HCl | 3540000 | 3540000500 |
| Propafenone and Flecainide | 353000 | 3530005000 |
| Dronedarone | 35400028 | 3540002810 |
| Betapace (Sotalol) | 33100045 | 33100045 |
| Tikosyn | 35400025 | 3540002500 |
| Disopyramide (Norpace) | 35100010 | 3510001010 |
| Quinidine | 351000301 | 3510003010, 3510003030 |
| Ketoconazole | 11404040 | 1140404000 |

**Table 4. Charlson Comorbidity Index Calculation**

Programming algorithm for the Charlson Comorbidity Index (CCI)

1. Identify all patients who ever had the following conditions during their baseline period.

| **Condition** | [redacted] | [redacted] |
|---|---|---|
| Myocardial Infarction | 410.x, 412.x | I21.xx, I22.x, I25.2 |
| Congestive Heart Failure | 428.x | I50.xx |
| Peripheral Vascular | 441.x, 443.9x, | I71.xx, I73.9, I96, Z95.828 |

| | | |
|---|---|---|
| Disease | 785.4x, V43.4x | |
| Cerebrovascular Disease | 430.x-438.x | G45.0-G45.2, G45.4-G46.8, I60.xx-I69.xxx (exclude I67.3, I67.83) |
| Dementia | 290.x | F01.5x, F03.90 |
| Rheumatologic Disease | 710.0x, 710.1x, 710.4x, 714.0x, 714.1x, 714.2x, 725.x, 714.81 | M05.xx-M06.9 (exclude M06.4), M32.xx, M33.20, M34.xx, M35.3 |
| Peptic Ulcer Disease | 531.4x-531.7x, 532.4x-532.7x, 533.4x-533.7x, 534.4x-534.7x, 531.0x-531.3x, 532.0x-532.3x, 533.0x-533.3x, 534.0x-534.3x, 531.9x, 532.9x, 534.9x | K25.0-K28.9 |
| Mild Liver Disease | 571.2x, 571.4x, 571.5x, 571.6x | K70.2, K70.3x, K73.x, K74.xx, K75.4 |
| Diabetes (mild to moderate) | 250.0x, 250.1x, 250.2x, 250.3x, 250.7x | E10.1x, E10.5x, E10.641, E11.0x, E11.5x, E11.641, E13.0x, E13.1x, E13.5x, E13.641, E13.9 |
| Diabetes with Complications | 250.4x, 250.5x, 250.6x | E10.3xxx, E10.4x, E10.610, E11.2x, E11.3xxx, E11.4x, E11.610, E13.2x, E13.3xxx, E13.4x, E13.610 |
| Hemiplegia or Paraplegia | 342.x, 344.1x | G81.xx, G82.2x |
| Renal Disease | 582.x, 585.x, 586.x, 588.x | N03.x, N18.x, N19, N25.xx, N27.x |
| Malignancy | 140.x-172.x, 174.x-195.x, 201.x, 203.x, 205.x-208.x | C00.x-C43.xx, C45.x-C49.xx, C50.xxx-C76.xx, C81.xx, C88.2, C88.3, C88.8, C88.9, C90.xx, C92.xx-C95.xx, D03.xx, D45 |
| Moderate or Severe Liver Disease | 572.2x-582.8x, 456.0x, 456.1x, 456.2x | I85.xx, K72.1x, K72.9x, K75.0, K75.1, K75.2, K75.3, K75.8x, K75.9, K76.1, K76.3-K76.9, K77, K80.xx-K90.49, K90.89, K90.9, K91.2, K91.5, K92.0, K92.1, K92.2, N00.0-N03.8, N04.0-N04.9 |
| Metastatic Solid Tumor | 196.x-199.x | C77.x-C79.x, C80.x |
| AIDS | 042.x-044.x | B20 |
| Chronic Obstructive Pulmonary Disease and allied conditions | 490.x | J40 |
| | 491.x | J41.1, J41.8, J44.x, J42 |
| | 492.x | J43.x |
| | 493.x | J45.xxx, J44.x |
| | 494.x | J47.x |

| | |
|---|---|
| 495.x | J67.x |
| 496.x | J44.9 |

2. If a patient had both the milder and more severe form of the condition, only count the more severe form of the condition -- Diabetes (mild to moderate) / Diabetes with complications; Mild liver disease / Moderate or severe liver disease; Malignancy / Metastatic solid tumor.
3. Weight each of the baseline conditions by the given weights and sum the number of conditions the patient has at baseline. This sum is the patient's CCI at baseline.

**Table 5. CHADS2 Stroke Risk Score**

| **$CHADS_2$ Risk Criteria** | [redacted] | [redacted] |
|---|---|---|
| Congestive Heart Failure | 428.x | I50.xx |
| Hypertension | 401.x–405.x, 437.2 | I10-I16.x, I67.4 |
| Diabetes | 250.x | E10.xxxx, E11.xxxx, E13.xxxx |
| Stroke/ transient ischemic attack (TIA) | 433.x1, 434.x1, 435.x, 436, 437.1x, 437.9x, 438.x | G45.0-G45.2, G45.8-G46.2, I63.xxx, I67.8xx, I67.9, I69.xxx |

After assessing the risk factors and adding up the risk score, the stroke risk classifications are as below:

| **Score** | **$CHADS_2$Stroke Risk Classification** |
|---|---|
| 0 | Low |
| 1 | Intermediate |
| 2–6 | High |

**Table 6. CHA2DS2-VASc Stroke Risk Score**

| **$CHA_2DS_2$-VASc Criteria** | [redacted] | [redacted] |
|---|---|---|
| Congestive heart | 428.x, | I50.xx, |

| | | |
|---|---|---|
| failure or left ventricle dysfunction | 398.91, 402.01, 402.11, 402.91, 404.01, 404.11, 404.91, 404.03, 404.13, 404.93, 425.4, 425.5, 425.7 | I09.81, I11.0, I13.0, I13.2, I42.5, I42.6, I42.8, I42.9, I43 |
| Hypertension | 401.x–405.x, 437.2 | I10-I16.x, I67.4 |
| Diabetes Mellitus | 250.x | E10.xxxx, E11.xxxx, E13.xxxx |
| Stroke/TIA | 433.x1, 434.x1, 435.x, 436, 437.1x, 437.9x, 438.x | G45.0-G45.2, G45.8-G46.2, I63.xxx, I67.8xx, I67.9, I69.xxx |
| Vascular disease (prior myocardial infarction, peripheral artery disease, or aortic plaque) | 410.xx, 412.xx; 440.2x, 443.8x, 443.9x; ICD-9 proc code: 88.48; CPT code: 75710, 75716, 93922, 93923 | I21.xx, I22.xx, I25.2, I70.2xx, I73.8x, I73.9, I79.1, I79.8; ICD-10 proc code: B40F0ZZ, B40F1ZZ, B40FYZZ, B40G0ZZ, B40G1ZZ, B40GYZZ, B40J0ZZ, B40J1ZZ, B40JYZZ, B41F0ZZ, B41F1ZZ, B41FYZZ, B41G0ZZ, B41G1ZZ, B41GYZZ, B41J0ZZ, B41J1ZZ, B41JYZZ |

After assessing the risk factors and adding up the risk score, the stroke risk classifications are as below:

| **Score** | **$CHA_2DS_2$-VASc Stroke Risk Classification** |
|---|---|
| 0 | Low |
| 1 | Intermediate |
| 2 or greater | High |

**Table 7. HAS-BLED Bleed Risk Score**

| **HAS-BLED Criteria** | [redacted] | [redacted] |
|---|---|---|
| Hypertension | 401.x-405.x | I10-I16.x |
| | Drugs used to treat hypertension (GPI codes 3300, 3400, 3610, 3615, 3620, 3625, 3630, 3640, 3660, 3720, 3760) | |
| Abnormal renal and liver function | Renal: 580.xx-586.xx, V56.0, V56.8; ICD-9 procedure codes 39.95, 54.98; CPT codes 90935-90993, 99512, 99559 | N00.0-N08, N17.0-N19, Z49.31, Z49.32; ICD-10 procedure code: 3E1M39Z, 5A1D00Z, 5A1D60Z |

| | | |
|---|---|---|
| (1 point for each) | Liver: 070.x, 155.0x, 155.1x, 155.2x, 571.x, 572.x, 573.x, 576.8, 456.0x, 456.1x, 456.2x; ICD-9 procedure codes 39.1x, 42.91 | B15.x-B19.xx, C22.x, I85.xx, K70.xx, K71.xx, K72.01-K76.1, K76.3-K77, K83.5; ICD10 procedure code: 0610xxx, 0611xxx, 0612xxx, 0614xxx, 0615xxx, 0616xxx, 0617xxx, 0618xxx, 0619xxx, 061Bxxx, 061Jxxx, 06L30CZ, 06L30DZ, 06L30ZZ, 06L33CZ, 06L33DZ, 06L33ZZ, 06L34CZ, 06L34DZ, 06L34ZZ |
| Stroke | 433.xx-437.xx | G45.x, G46.x, I63.xxx-I66.9, I67.1, I67.2, I67.4-I67.82, I67.84x-I68.8 |
| Bleeding (includes anemia and other prior hemorrhage) | 285.0x, 285.1x, 285.9x, 423.0x, 430.x-432.x, 455.2x, 455.5x, 455.8x, 459.0x, 531.0x, 531.2x, 531.4x, 531.6x, 532.0x, 532.2x, 532.4x, 532.6x, 533.0x, 533.2x, 533.4x, 533.6x, 534.0x, 534.2x, 534.4x, 534.6x, 562.02, 562.03, 562.12, 562.13, 568.81, 569.3, 569.83, 569.85, 569.86, 578.0, 578.1, 578.9, 599.7x, 719.1x, 784.7x, 786.3x; ICD-9 procedure code 44.43; CPT code 43255 | D62, D64.0, D64.1, D64.2, D64.3, D64.9, I31.2, I60.xx, I61.x, I62.xx, K25.0, K25.2, K25.4, K25.6, K26.0, K26.2, K26.4, K26.6, K27.0, K27.2, K27.4, K27.6, K28.0, K28.2, K28.4, K28.6, K55.21, K57.11, K57.13, K57.31, K57.33, K62.5, K63.1, K63.81, K64.4, K64.8, K66.1, K92.0, K92.1, K92.2, M25.0xx, R04.0, R04.2, R04.81, R04.89, R04.9, R31.0, R31.1, R31.21, R31.29, R31.9, R58;<br>ICD-10 procedure code: 0W3P8ZZ |
| Labile INRs | | |
| Elderly (Age >65 years) | - | |
| Drug or alcohol abuse (1 point for each) | Drug: NSAIDs (GPI codes 6410, 6610), Anti-platelets (8515), Other aspirin-containing products (3940990215, 4399100222, 4399100223, 4399100232, 4399100405, 4399400321, 4399400456, 4399590415, 4399590419, 6030990225, 6499000220, 6499000221, 6499000225, 6499000226, 6499000232, 6499000320, 6499000321, 6499000335, 6499000340, 6499000450, 6499000460, 6499100220, 6499100222, 6499100228, 6499100330, 6499100335, 6599000222, 6599100210, 6599100220, 6599100325, 6599100430, 6599100510, 6599170220, 6599400220, 7599000210, 7599000240, 7599000310, 7599000320, 8515990220, 9990000000) | |
| | | |

| | | |
|---|---|---|
| | Alcohol: 291.xx, 303.xx, 305.0x, 357.5x, 425.5x, 571.1x, 571.2x, 571.3x; ICD-9 procedure codes 94.61-94.63, 94.67-94.69 | F10.xxx, G62.1, I42.6, K70.xx; ICD-10 procedure code: HZ2ZZZZ, HZ30ZZZ, HZ31ZZZ, HZ32ZZZ, HZ33ZZZ, HZ34ZZZ, HZ35ZZZ, HZ36ZZZ, HZ37ZZZ, HZ38ZZZ, HZ39ZZZ, HZ3BZZZ, HZ40ZZZ, HZ41ZZZ, HZ42ZZZ, HZ43ZZZ, HZ44ZZZ, HZ45ZZZ, HZ46ZZZ, HZ47ZZZ, HZ48ZZZ, HZ49ZZZ, HZ4BZZZ, HZ50ZZZ, HZ51ZZZ, HZ52ZZZ, HZ53ZZZ, HZ54ZZZ, HZ55ZZZ, HZ56ZZZ, HZ57ZZZ, HZ58ZZZ, HZ59ZZZ, HZ5BZZZ, HZ5CZZZ, HZ5DZZZ, HZ63ZZZ, HZ83ZZZ, HZ86ZZZ, HZ88ZZZ, HZ89ZZZ, HZ93ZZZ, HZ96ZZZ, HZ98ZZZ, HZ99ZZZ |

*the maximum score will be 8 since we do not have data available for labile INRs

After assessing the risk factors and adding up the score, the bleed risk classifications are as follows:

| **Score** | **HAS-BLED Bleed Risk Classification** |
|---|---|
| 0-1 | Low |
| 2 | Intermediate |
| 3 or greater | High |

**Table 8. Atrial Fibrillation Medications**

| **Rate control medications** | **GPI codes starting with:** | **GPI 10** |
|---|---|---|
| Beta blockers | 3300 | 3310004510, 3310004512 |
| Calcium channel blockers | | 3400000710, 3400000310, 3400001010, 3400001011, 3400001012, 3400001015, 3400001050, 3400001300, 3400001500, 3400001810, 3400001812, 3400001814, 3400002000, 3400002200, 3400002400, 3400003010 |
| Verapamil | 34000030100 | 3400003010 |
| Diltiazem | 340000101 | 3400001010, 3400001011, 3400001012, 3400001015, 3400001050 |
| Digoxin/digitoxin | 321000 | 3120001000 |
| Dronedarone | 35400028100320 | 3540002810 |
| Amiodarone | 3540000500 | 3540000500 |
| Rhythm control medications | | |
| Disopyramide (Norpace) | 35100010 | 3510001010 |
| Procainamide | 3510002010 | 3510002010 |

| | | |
|---|---|---|
| Flecainide | 3530001 | 3530001010 |
| Propafenone | 3530005 | 3530005000 |
| Betapace (Sotalol) | 33100045 | 3310004510, 3310004512 |
| Tikosyn (Dofetilide) | 35400025 | 3540002500 |
| Quinidine | 351000301 | 3510003010, 3510003030 |
| Mexiletine | 352000251 | not exist |
| Moricizine | 35050301003 | not exist |
| Other | | |
| ACE Inhibitors | 3610 | 36100005, 36100010, 36100020, 36100025, 36100027, 36100030, 36100033, 36100035, 36100040, 36100050, 36100060 |
| Angiotensin-II Receptor Blockers (ARB) | 3615 | 3615004020, 3615003000, 3615002010, 3615008000, 3615005520, 3615007000, 3615002420, 3615001020 |
| Diuretics (Thiazide, loop) | 3720, 3760 | 3710001000, 3710001010, 3710002000, 3710003000, 3720001000, 3720002000, 3720002010, 3720003000, 3720008000, 3740001000, 3740003000, 3750001010, 3750002000, 3750003000, 3760001000, 3760002000, 3760002010, 3760002500, 3760004000, 3760005000, 3760005500, 3760006000, 3790003000, 3799000210, 3799000220, 3799000230, 3799200410 |
| Antihypertensives (excluding above group) | 3620, 3625, 3630, 3640, 3660 | 3610000510, 3610001000, 3610002010, 3610002510, 3610002710, 3610003000, 3610003310, 3610003510, 3610004010, 3610005000, 3610006000, 3615001020, 3615002010, 3615002420, 3615003000, 3615004020, 3615005520, 3615007000, 3615008000, 3617001010, 3620101010, 3620102510, 3620103000, 3620103010, 3620200510, 3620203010, 3620204010, 3620304000, 3625003000, 3630001010, 3630002010, 3630002500, 3640001010, 3640002000, 3640004010, 3640203010, 3660002010, 3699150220, 3699150223, 3699150270, 3699180215, 3699180225, 3699180235, 3699180240, 3699180255, 3699180260, 3699180265, 3699200210, 3699200213, 3699200220, 3699200230, 3699200240, 3699270250, 3699300205, 3699300210, 3699300270, 3699400210, 3699400220, 3699400225, 3699400230, 3699400245, 3699400250, 3699400260, 3699400270, 3699450320, 3699450345, 3699500220, 3699500270, 3699600215, 3699670210, 3699680320, 3699850250, 3699880260 |

| | | |
|---|---|---|
| Fondaparinux | 83103030 | 8310303010 (Also include HCPCS code: Injection, fondaparinux sodium, 0.5 mg - **J1652**) |
| Anticoagulants | | |
| Dabigatran | 833370302001 | 8333703020 |
| Argatroban | 83337015 | 8333701500, 8333701520 |
| Warfarin | 83200030 | 8320003020 |
| Heparin | 83100020 | 8310002020, 8310002022, 8310002025, 8310002030, (Also include HCPCS code: Injection, heparin sodium, (heparin lock flush), per 10 units - **J1642**, Injection, heparin sodium, per 1000 units - **J1644**) |
| Enoxaparin | 83101020 | 8310102010 (Also include HCPCS code: Injection, enoxaparin sodium, 10 mg - **J1650**) |
| Tinzaparin | 83101080 | not exist in GPI database (Include HCPCS code: Injection, tinzaparin sodium, 1000 iu - **J1655**) |
| Dalteparin | 83101010 | 8310101010 (Also include HCPCS code: Injection, dalteparin sodium, per 2500 iu - **J1645**) |
| Rivaroxaban | 83370060 | 8337006000 |
| Apixaban | 83370010 | 8337001000 |
| Antiplatelet | | |
| Clopidogrel | 85158020 | 8515802010 |
| **Brilinta (**ticagrelor) | 85158470 | 8515847000 |
| Prasugrel | 85158060100330, 85158060100320 | 8515806010 |
| Ticlopidine | 85158080100320 | 8515808010 |
| Cilostazol | 85155516000320, 85155516000330 | 8515551600 |
| Dipyridamole | 85150030000310, 85150030000320, 85150030000330 | 8515003000 |
| NSAIDs | 6610 | 6610007000, 6610003000, 6610002000, 6610004010, 6610001010, 6610006000, 6610008000, 6610006010, 6610009010, 6610001200, 6610005000, 6610006500, 6610003500, 6610000710, 6610101000, 6610000720, 6610000800, 6610003710, 6610990220, 6610052500, 6610005200, 6610005500, 6610003010, 6610002040, 6610006050, 6610002050, 6610990328, 6610990244, 6610005260, 6610990232, 6610000700, 6610990241, 6610990340, 6610990435, 6610990337, 6610990217, 6610990338, 6610990256, 6610990440, 6610990339, 6610990315, 6610990317, |

| | | |
|---|---|---|
| | | 6610990238, |

**Table 9. Outcome Codes**

| Medical Conditions | ICD-9 Codes | Description | ICD-10 Codes |
|---|---|---|---|
| Stroke | | Inclusive of ischemic stroke and hemorrhagic stroke below | |
| Major Bleeding | | Inclusive of hemorrhagic stroke, major intracranial bleeding and major extracranial bleeding below | |
| Ischemic Stroke (Primary Only) | 433.x1 | Occlusion and stenosis of precerebral arteries with cerebral infarction | I63.xxx |
| | 434.x1 | Occlusion of cerebral arteries with cerebral infarction | |
| | 436 | Acute, but ill-defined, cerebrovascular disease | I67.89 |
| | Exclusion | EXCLUDE above codes if hospitalization lasted <48 hours and was accompanied by carotid endarterectomy (ICD-9 procedure code 38.1) | |
| Hemorrhagic Stroke (Primary Only) | | | |
| | 431 | Intracerebral hemorrhage (ICH) | I61.x |
| | Exclusion | EXCLUDE above codes if "traumatic brain injury" ICD-9-CM code (800 to804, 850 to 854) or "rehabilitation care" as the primary ICD-9-CM code (V57) is present. | S02.xxxA, S02.xxxB, S06.xxxA, Z51.89 |
| Major Intracranial Bleeding (Primary or Secondary) | 430 | Subarachnoid hemorrhage | I60.xx |
| | 431 | Intracerebral hemorrhage | I61.x |
| | 432.x | Other and unspecified intracranial hemorrhage | I62.xx |
| | 852.0 | Subarachnoid hemorrhage following injury without mention of open intracranial wound | S06.36xA |
| | 852.2 | Subdural hemorrhage following injury without mention of open intracranial wound | S06.4XxA |
| | 852.4 | Extradural hemorrhage following injury without mention of open intracranial wound | S06.5XxA |
| | 853.0 | Other and unspecified intracranial hemorrhage following injury without mention of open intracranial wound | S06.6XxA |

| | | | |
|---|---|---|---|
| | Exclusion | EXCLUDE – above codes if concomitant discharge diagnosis of major trauma was present (*ICD-9* codes 852.1, 852.3, 852.5, and 853.1) | S01.90XA, S06.36xA, S06.4XxA, S06.5XxA, S06.6XxA |
| Major Extracranial | | Inclusive of major GI bleeding, major urogenital bleeding and major other bleeding | |
| Major GI Bleeding | | Inclusive of major upper GI bleeding and major lower GI bleeding | |
| Major upper GI bleed (Primary Only) | 531.0x | Acute gastric ulcer with hemorrhage with/without obstruction | K25.0 |
| | 531.2x | With hemorrhage and perforation with/without obstruction | K25.2 |
| | 531.4x | (chronic or unspecified gastric ulcer with hemorrhage with/without obstruction) | K25.4 |
| | 531.6x | (with hemorrhage and perforation with/without obstruction) | K25.6 |
| | 532.0x | (acute duodenal ulcer with hemorrhage with/without obstruction) | K26.0 |
| | 532.2x | (with hemorrhage and perforation with/without obstruction) | K26.2 |
| | 532.4x | (chronic or unspecified duodenal ulcer with hemorrhage with/without obstruction) | K26.4 |
| | 532.6x | (with hemorrhage and perforation with/without obstruction) | K26.6 |
| | 533.0x | (acute peptic ulcer of unspecified site with hemorrhage with/without obstruction) | K27.0 |
| | 533.2x | (with hemorrhage and perforation with/without obstruction) | K27.2 |
| | 533.4x | (chronic or unspecified peptic ulcer of unspecified site with hemorrhage with/without obstruction) | K27.4 |
| | 533.6x | (with hemorrhage and perforation with/without obstruction), | K27.6 |
| | 534.0x | (acute gastrojejunal ulcer with hemorrhage with/without obstruction) | K28.0 |
| | 534.2x | (with hemorrhage and perforation with/without obstruction) | K28.2 |
| | 534.4x | (chronic or unspecified gastrojejunal ulcer with hemorrhage with/without obstruction) | K28.4 |
| | 534.6x | (with hemorrhage and perforation with/without obstruction) | K28.6 |

| | | | |
|---|---|---|---|
| | 578.0 | (hematemesis) | K92.0 |
| | ICD-9 Procedure Code 44.43 | (endoscopic control of gastric or duodenal bleeding) | |
| | CPT code 43255 | (upper gastrointestinal endoscopy including esophagus, stomach, and either the duodenum and/or jejunum as appropriate with control of bleeding, any method) | |
| Major lower GI bleeding (Primary Only) | 562.02 | Diverticulosis of small intestine with hemorrhage | K55.21 |
| | 562.03 | Diverticulitis of small intestine with hemorrhage | K57.11 |
| | 562.12 | Diverticulosis of colon with hemorrhage | K57.13 |
| | 562.13 | Diverticulitis of colon with hemorrhage | K57.31 |
| | 569.3x | Hemorrhage of rectum and anus | K57.32 |
| | 569.85 | Angiodysplasia of intestine with hemorrhage | K62.5 |
| | 578.1x | Blood in stool | K92.1 |
| | 578.9 | Hemorrhage of GI tract, unspecified | K92.2 |
| Major urogenital bleed (Primary Only) | 599.7 | Hematuria | R31.0 - R31.29 |
| | 626.2x and (280.0, 285.1 or 285.9) | Excessive/frequent menstruation and secondary diagnosis indicating acute bleeding (anemia) | N92.0 and (D50.0, D62, D64.9) |
| Other major bleeds (Primary Only) | 719.1x | Hemathrosis | D62 |
| | 423.0x | Hemopericardium | I31.2 |
| | 786.3x | Hemoptysis | M25.0xx |
| | 784.7x | Epistaxis | R04.0 |
| | 459.0x | Hemorrhage not specified | R04.2 |
| | 285.1x | Acute posthemorrhagic anemia | R04.8x, R04.9, R58 |
| TIA (Primary Only) | 435.x | Transient cerebral ischemia as the principal (primary) discharge diagnosis | G45.0, G45.1, G45.8, G45.9, G46.0, G46.1, G46.2 |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | | [redacted] | |
| [redacted] | [redacted] | [redacted] | [redacted] |
| | [redacted] | [redacted] | [redacted] |

| | | | |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] |

## APPENDIX B: Inclusion and exclusion diagnosis, procedure and CPT codes

**Table 1. List of codes for atrial fibrillation**

| Study Inclusion DX | ICD9 Diagnosis Codes | ICD10 Diagnosis Codes |
|---|---|---|
| Atrial Fibrillation | 427.31 | I48.0, I48.1, I48.2, I48.91 |

**Table 2. List of codes and descriptions to identify patients with exclusion diagnoses**

| Study Exclusion DX | ICD9 Diagnosis Codes | ICD10 Diagnosis Codes |
|---|---|---|
| Hyperthyroidism | 242.x | E05.00, E05.01, E05.10, E05.11, E05.20, E05.21, E05.30, E05.31, E05.40, E05.41, E05.80, E05.81, E05.90, E05.91 |
| Orthopedic Procedures (See also procedure codes) | V43.64, V43.65 | Z9664x, Z9665x |
| DVT | 451.xx, 453.xx | I80.xxx, I82.xxx |
| PE | 415.1x | I26.01, I26.09, I26.90, I26.92, I26.99, I27.82 |
| Perocarditis | 391.x, 393, 420.x, 423.2, 036.41, 074.21, 093.81, 098.83 | A39.53, B33.23, I01.0, I09.2, I30.0, I30.1, I30.8, I30.9, I31.0, I32, M32.12 |
| Myocarditis | 391.2, 422.xx, 074.23, 398.0, 429.0, 032.82, 036.43, 093.82, 130.3 | A36.81, A38.1, A39.52, A52.06, A54.83, B26.82, B33.22, B58.81, D86.85, I01.2, I09.0, I40.0, I40.1, I40.8, I41, I511.4, J10.82, J11.82 |
| Pulmonary Embolism | 415.1x | I26.01, I26.09, I26.90, I26.92, I26.99, I27.82 |
| Valvular Afib | | |
| Mitral stenosis | 394.0x | I05.0, I05.1, I05.2, I05.8, I05.9, I34.2 |
| Mitral stenosis with insufficiency | 394.2 | I34.0, I34.2, I34.8, I34.9 |
| Mitral valve stenosis and aortic valve stenosis | 396.0 | I06.0, I35.0, Q23.0 |
| Mitral valve stenosis and aortic valve insufficiency | 396.1 | I08.0, I06.1, I25.1, Q23.1, Q23.8, Q23.9 |

| | | |
|---|---|---|
| Diseases of other endocardial structures | 397.x | I07.x, I09.89, I08.1, I08.2, I08.3, I08.8, I08.9 |
| Other and unspecified rheumatic heart diseases | 398.9x | I09.9, I09.81, I09.89 |
| Heart valve replaced by transplant | V42.2 | Z95.3, Z95.4 |
| Heart valve replaced by a mechanical device/prosthesis | V43.3 | Z95.2 |
| Atrioventricular valve repair | V43.3 | Z95.2 |
| Aortic valve valvuloplasty/diseases of aortic valve | 395.x | I06.x |

**Table 3. List of codes and descriptions to identify patients with exclusion procedures**

| **Subject Exclusion Criteria:** | **ICD9 Procedure Codes** | **ICD10 Procedure Codes** | **CPT Codes** |
|---|---|---|---|
| Valvular Afib Procedure/CPT codes | | | |
| Open heart valvuloplasty without replacement | 35.1x | 02QF0ZZ, 02QG0ZZ, 02QH0ZZ, 02QJ0ZZ, 027F04Z, 027F0DZ, 027F0ZZ, 02NF0ZZ, 02QF0ZZ, 027G04Z, 027G0DZ, 027G0ZZ, 02NG0ZZ, 02QG0ZZ, 027H04Z, 027H0DZ, 027H0ZZ, 02NH0ZZ, 02QH0ZZ, 027J04Z, 027J0DZ, 027J0ZZ, 02NJ0ZZ, 02QJ0ZZ | |

| | | | |
|---|---|---|---|
| Open And Other Replacement Of Heart Valve (This includes : Open and other replacement of unspecified heart valve, Open and other replacement of aortic valve, Open and other replacement of mitral valve , Open and other replacement of mitral valve , Open and other replacement of pulmonary valve, Open and other replacement of tricuspid valve.) | 35.2x | 02RF07Z, 02RF08Z, 02RF0JZ, 02RF0KZ, 02RF47Z, 02RF48Z, 02RF4JZ, 02RF4KZ, 02RG07Z, 02RG08Z, 02RG0JZ, 02RG0KZ, 02RG47Z, 02RG48Z, 02RG4JZ, 02RG4KZ, 02RH07Z, 02RH08Z, 02RH0JZ, 02RH0KZ, 02RH47Z, 02RH48Z, 02RH4JZ, 02RH4KZ, 02RJ07Z, 02RJ08Z, 02RJ0JZ, 02RJ0KZ, 02RJ47Z, 02RJ48Z, 02RJ4JZ, 02RJ4KZ, 02RF07Z, 02RF08Z, 02RF0KZ, 02RF47Z, 02RF48Z, 02RF4KZ, X2RF032, X2RF432, 02RF0JZ, 02RF4JZ, 02RG07Z, 02RG08Z, 02RG0KZ, 02RG37Z, 02RG38Z, 02RG3KZ, 02RG47Z, 02RG48Z, 02RG4KZ, 02RG0JZ, 02RG3JZ, 02RG4JZ, 02RH07Z, 02RH08Z, 02RH0KZ, 02RH47Z, 02RH48Z, 02RH4KZ, 02RH0JZ, 02RH4JZ, 02RJ07Z, 02RJ08Z, 02RJ0KZ, 02RJ47Z, 02RJ48Z, 02RJ4KZ, 02RJ0JZ, 02RJ4JZ | |
| Closed Heart Valvotomy | 35.0x | 02NF3ZZ, 02NF4ZZ, 02NG3ZZ, 02NG4ZZ, 02NH3ZZ, 02NH4ZZ, 02NJ3ZZ, 02NJ4ZZ, 02NF3ZZ, 02NF4ZZ, 02NG3ZZ, 02NG4ZZ, 02NH3ZZ, 02NH4ZZ, 02NJ3ZZ, 02NJ4ZZ, 02RF37Z, 02RF38Z, 02RF3JZ, 02RF3KZ, X2RF332, 02RF37H, 02RF38H, 02RF3JH, 02RF3KH, 02RH37Z, 02RH38Z, 02RH3JZ, 02RH3KZ, 02RH37H, 02RH38H, 02RH3JH, 02RH3KH, 02RF37Z, 02RF38Z, 02RF3JZ, 02RF3KZ, 02RG37H, 02RG37Z, 02RG38H, 02RG38Z, 02RG3JH, 02RG3JZ, 02RG3KH, 02RG3KZ, | |

| | | | |
|---|---|---|---|
| | | 02RH37Z, 02RH38Z, 02RH3JZ, 02RH3KZ | |
| Unlisted procedure, cardiac surgery | | | 33999 |
| Implantation of catheter-delivered prosthetic aortic heart valve; open thoracic approach | | | 0257T |
| Transthoracic cardiac exposure (e.g., sternotomy, thoracotomy, subxiphoid) for catheter-delivered aortic valve replacement; without cardiopulmonary bypass | | | 0258T |
| Transthoracic cardiac exposure (e.g., sternotomy, thoracotomy, subxiphoid) for catheter-delivered aortic valve replacement; with cardiopulmonary bypass | | | 0259T |
| Replacement, aortic valve, with cardiopulmonary bypass; with prosthetic valve other than homograft or | | | 33405 |

| | | | |
|---|---|---|---|
| stentless valve | | | |
| Valvuloplasty, mitral valve, with cardiopulmonary bypass | | | 33425 |
| Valvuloplasty, mitral valve, with cardiopulmonary bypass; with prosthetic ring | | | 33426 |
| Valvuloplasty, mitral valve, with cardiopulmonary bypass; radical reconstruction, with or without ring | | | 33427 |
| Replacement, mitral valve, with cardiopulmonary bypass | | | 33430 |
| Implantation of catheter-delivered prosthetic pulmonary valve, endovascular approach | | | 0262T |
| Replacement, pulmonary valve | | | 33475 |
| Valvectomy, tricuspid valve, with cardiopulmonary bypass | | | 33460 |
| Valvuloplasty, tricuspid valve; without ring insertion | | | 33463 |
| Valvuloplasty, tricuspid valve; with ring insertion | | | 33464 |
| Replacement, tricuspid valve, with | | | 33465 |

| | | | |
|---|---|---|---|
| cardiopulmonary bypass | | | |
| Description for CPT=33660-33665 | | | 33660 - 33665 |
| Description for CPT=33400-33403 | | | 33400 - 33403 |
| Orthopedic Procedures (Hip/Knee) | | | |
| Total/Partial Hip Replacement | 81.52 | 0SRA009,0SRA00A,0SRA00Z,0SRA019,0SRA01A,0SRA01Z,0SRA039,0SRA03A,0SRA03Z,0SRA07Z,0SRA0J9,0SRA0JA,0SRA0JZ,0SRA0KZ,0SRE009,0SRE00A,0SRE00Z,0SRE019,0SRE01A,0SRE01Z,0SRE039,0SRE03A,0SRE03Z,0SRE07Z,0SRE0J9,0SRE0JA,0SRE0JZ,0SRE0KZ,0SRR019,0SRR01A,0SRR01Z,0SRR039,0SRR03A,0SRR03Z,0SRR07Z,0SRR0J9,0SRR0JA,0SRR0JZ,0SRR0KZ,0SRS019,0SRS01A,0SRS01Z,0SRS039,0SRS03A,0SRS03Z,0SRS07Z,0SRS0J9,0SRS0JA,0SRS0JZ | |
| | 81.51 | 0SR90J9,0SR90JA,0SR90JZ,0SRB0J9,0SRB0JA,0SRB0JZ | |

| | | | |
|---|---|---|---|
| | 0070, 0071, 0072, 0073, 8153 | 0SP908Z,0SP909Z,0SP90BZ,0SP90JZ,0SPB08Z,0SPB09Z,0SPB0BZ,0SPB0JZ,0SR9019,0SR901A,0SR901Z,0SR9029,0SR902A,0SR902Z,0SR9039,0SR903A,0SR903Z,0SR9049,0SR904A,0SR904Z,0SR90J9,0SR90JA,0SR90JZ,0SRB019,0SRB01A,0SRB01Z,0SRB029,0SRB02A,0SRB02Z,0SRB039,0SRB03A,0SRB03Z,0SRB049,0SRB04A,0SRB04Z,0SRB0J9,0SRB0JA,0SRB0JZ,0SP908Z,0SP909Z,0SP90BZ,0SPA0JZ,0SPB08Z,0SPB09Z,0SPB0BZ,0SPE0JZ,0SRA009,0SRA00A,0SRA00Z,0SRA019,0SRA01A,0SRA01Z,0SRA039,0SRA03A,0SRA03Z,0SRA0J9,0SRA0JA,0SRA0JZ,0SRE009,0SRE00A,0SRE00Z,0SRE019,0SRE01A,0SRE01Z,0SRE039,0SRE03A,0SRE03Z,0SRE0J9,0SRE0JA,0SRE0JZ,0SP908Z,0SP909Z,0SP90BZ,0SPB08Z,0SPB09Z,0SPB0BZ,0SPR0JZ,0SPS0JZ,0SRR019,0SRR01A,0SRR01Z,0SRR039,0SRR03A,0SRR03Z,0SRR0J9,0SRR0JA,0SRR0JZ,0SRS019,0SRS01A,0SRS01Z,0SRS039,0SRS03A,0SRS03Z,0SRS0J9,0SRS0JA,0SRS0JZ,0SP908Z,0SP909Z,0SP90BZ,0SP90JZ,0SPB08Z,0SPB09Z,0SPB0BZ,0SPB0JZ,0SU909Z,0SUA09Z,0SUB09Z,0SUE09Z,0SUR09Z,0SUS09Z,0SW90JZ,0SW93JZ,0SW94JZ,0SWA0JZ,0SWA3JZ,0SWA4JZ,0SWB0JZ,0SWB3JZ,0SWB4JZ,0SWE0JZ,0SWE3JZ,0SWE4JZ,0SWR0JZ,0SWR3JZ,0SWR4JZ,0SWS0JZ,0SWS3JZ,0SWS4JZ | |
| | | | 27125, 27130, 27132 |

| | | | |
|---|---|---|---|
| | | | , 27134 , 27137 , 27138 |
| Total/Partial Knee Replacement | 81.54 | 0SRC07Z,0SRC0JZ,0SRC0KZ, 0SRC0LZ,0SRD07Z,0SRD0JZ, 0SRD0KZ,0SRD0LZ,0SRT07Z, 0SRT0JZ,0SRT0KZ,0SRU07Z, 0SRU0JZ,0SRU0KZ,0SRV07Z, 0SRV0JZ,0SRV0KZ,0SRW07Z ,0SRW0JZ,0SRW0KZ | |
| | 0080, 0081, 0082, 0083, 0084, 8155 | 0SPC08Z,0SPC09Z,0SPC0JZ,0 SPC48Z,0SPC4JZ,0SPD08Z,0S PD09Z,0SPD0JZ,0SPD48Z,0SP D4JZ,0SRC0J9,0SRC0JA,0SRC 0JZ,0SRD0J9,0SRD0JA,0SRD0 JZ,0SPC08Z,0SPC09Z,0SPC48 Z,0SPC4JZ,0SPD08Z,0SPD09Z ,0SPD48Z,0SPD4JZ,0SPT0JZ,0 SPU0JZ,0SRV0J9,0SRV0JA,0S RV0JZ,0SRW0J9,0SRW0JA,0S RW0JZ,0SPC08Z,0SPC09Z,0S PC48Z,0SPC4JZ,0SPD08Z,0SP D09Z,0SPD48Z,0SPD4JZ,0SPV 0JZ,0SPW0JZ,0SRT0J9,0SRT0 JA,0SRT0JZ,0SRU0J9,0SRU0J A,0SRU0JZ,0QPD0JZ,0QPD3J Z,0QPD4JZ,0QPF0JZ,0QPF3JZ ,0QPF4JZ,0QRD0JZ,0QRD3JZ, 0QRD4JZ,0QRF0JZ,0QRF3JZ, 0QRF4JZ,0QUD0JZ,0QUD3JZ, 0QUD4JZ,0QUF0JZ,0QUF3JZ, 0QUF4JZ,0SUC09C,0SUD09C, 0SPC09Z,0SPD09Z,0SUV09Z,0 SUW09Z,0SWC0JC,0SWC0JZ, 0SWC3JC,0SWC3JZ,0SWC4JC ,0SWC4JZ,0SWD0JC,0SWD0J Z,0SWD3JC,0SWD3JZ,0SWD4 JC,0SWD4JZ,0SWT0JZ,0SWT 3JZ,0SWT4JZ,0SWU0JZ,0SW U3JZ,0SWU4JZ,0SWV0JZ,0S WV3JZ,0SWV4JZ,0SWW0JZ,0 SWW3JZ,0SWW4JZ | |

| | | | |
|---|---|---|---|
| | | | 27447, 27486, 27487, 27437, 27438, 27440, 27441, 27442, 27443, 27445, 27446 |
| Cardiac Surgery | 00.5x, 35.xx, 36.xx, 37.xx | 0210083,0210088,0210089,021008C,021008F,021008W,0210093,0210098,0210099,021009C,021009F,021009W,02100A3,02100A8,02100A9,02100AC,02100AF,02100AW,02100J3,02100J8,02100J9,02100JC,02100JF,02100JW,02100K3,02100K8,02100K9,02100KC,02100KF,02100KW,02100Z3,02100Z8,02100Z9,02100ZC,02100ZF,0210344,02103D4,0210444,0210483,0210488,0210489,021048C,021048F,021048W,0210493,0210498,0210499,021049C,021049F,021049W, | |
| | | 02104A3,02104A8,02104A9,02104AC,02104AF,02104AW,02104D4,02104J3,02104J8,02104J9,02104JC,02104JF,02104JW,02104K3,02104K8,02104K9,02104KC,02104KF,02104KW,02104Z3,02104Z8,02104Z9,02104ZC,02104ZF,0211083,0211088,0211089,021108C,021108F,021108W,0211093,0211098,0211099,021109C,021109F,021109W,021 | |

| | | | |
|---|---|---|---|
| | | 10A3,02110A8,02110A9,02110AC,02110AF,02110AW,02110J3,02110J8,02110J9,02110JC,02110JF,02110JW,02110K3,02110K8,02110K9,02110KC,02110KF,02110KW,02110Z3,02110Z8,02110Z9,02110ZC,02110ZF,0211344, | |
| | | 02113D4,0211444,0211483,0211488,0211489,021148C,021148F,021148W,0211493,0211498,0211499,021149C,021149F,021149W,02114A3,02114A8,02114A9,02114AC,02114AF,02114AW,02114D4,02114J3,02114J8,02114J9,02114JC,02114JF,02114JW,02114K3,02114K8,02114K9,02114KC,02114KF,02114KW,02114Z3,02114Z8,02114Z9,02114ZC,02114ZF,0212083,0212088,0212089,021208C,021208F,021208W,0212093,0212098,0212099,021209C,021209F,021209W,02120A3,02120A8,02120A9,02120AC,02120AF,02120AW,02120J3,02120J8,02120J9,02120JC, | |
| | | 02120JF,02120JW,02120K3,02120K8,02120K9,02120KC,02120KF,02120KW,02120Z3,02120Z8,02120Z9,02120ZC,02120ZF,0212344,02123D4,0212444,0212483,0212488,0212489,021248C,021248F,021248W,0212493,0212498,0212499,021249C,021249F,021249W,02124A3,02124A8,02124A9,02124AC,02124AF,02124AW,02124D4,02124J3,02124J8,02124J9,02124JC,02124JF,02124JW,02124K3,02124K8,02124K9,02124KC,02124KF,02124KW,02124Z3,02124Z8,02124Z9,02124ZC,02124ZF,0213083,0213088,0213089,021308C,021308F,021308W,0213093,0213 | |

| | | | |
|---|---|---|---|
| | | 098,0213099,021309C,021309F,<br>021309W,02130A3,02130A8,02<br>130A9,02130AC,02130AF,0213<br>0AW, | |
| | | 02130J3,02130J8,02130J9,0213<br>0JC,02130JF,02130JW,02130K<br>3,02130K8,02130K9,02130KC,<br>02130KF,02130KW,02130Z3,0<br>2130Z8,02130Z9,02130ZC,021<br>30ZF,0213344,02133D4,021344<br>4,<br>0213483,0213488,0213489,021<br>348C,021348F,021348W,02134<br>93,0213498,0213499,021349C,0<br>21349F,021349W,02134A3,021<br>34A8,02134A9,02134AC,02134<br>AF,02134AW,02134D4,02134J<br>3,02134J8,02134J9,02134JC,02<br>134JF,02134JW,02134K3,0213<br>4K8,02134K9,02134KC,02134<br>KF,02134KW,02134Z3,02134Z<br>8,02134Z9,02134ZC,02134ZF,0<br>21608P,021608Q,021608R,0216<br>09P, | |
| | | 021609Q,021609R,02160AP,02<br>160AQ,02160AR,02160JP,0216<br>0JQ,02160JR,02160KP,02160K<br>Q,02160KR,02160Z7,02160ZP,<br>02160ZQ,02160ZR,021648P,02<br>1648Q,021648R,021649P,02164<br>9Q,021649R,02164AP,02164A<br>Q,02164AR,02164JP,02164JQ,0<br>2164JR,02164KP,02164KQ,021<br>64KR,02164Z7,02164ZP,02164<br>ZQ,02164ZR,021708P,021708Q<br>,021708R,021708S,021708T,02<br>1708U,021709P,021709Q,0217<br>09R,021709S,021709T,021709<br>U,02170AP,02170AQ,02170AR | |

| | | | |
|---|---|---|---|
| | | ,02170AS,02170AT,02170AU,02170JP,02170JQ,02170JR,02170JS,02170JT,02170JU,02170KP,02170KQ,02170KR,02170KS,02170KT,02170KU,02170ZP,02170ZQ,02170ZR,02170ZS,02170ZT,02170ZU, | |
| | | 021748P,021748Q,021748R,021748S,021748T,021748U,021749P,021749Q,021749R,021749S,021749T,021749U,02174AP,02174AQ,02174AR,02174AS,02174AT,02174AU,02174JP,02174JQ,02174JR,02174JS,02174JT,02174JU,02174KP,02174KQ,02174KR,02174KS,02174KT,02174KU,02174ZP,02174ZQ,02174ZR,02174ZS,02174ZT,02174ZU,021K08P,021K08Q,021K08R,021K09P,021K09Q,021K09R,021K0AP,021K0AQ,021K0AR,021K0JP,021K0JQ,021K0JR,021K0KP,021K0KQ,021K0KR,021K0Z5,021K0Z8,021K0Z9,021K0ZC,021K0ZF,021K0ZP,021K0ZQ,021K0ZR,021K0ZW, | |
| | | 021K48P,021K48Q,021K48R,021K49P,021K49Q,021K49R,021K4AP,021K4AQ,021K4AR,021K4JP,021K4JQ,021K4JR,021K4KP,021K4KQ,021K4KR,021K4Z5,021K4Z8,021K4Z9,021K4ZC,021K4ZF,021K4ZP,021K4ZQ,021K4ZR,021K4ZW,021L08P,021L08Q,021L08R,021L09P,021L09Q,021L09R,021L0AP,021L0AQ,021L0AR,021L0JP,021L0JQ,021L0JR,021L0KP,021L0KQ,021L0KR,021L0Z5,021L0Z8,021L0Z9,021L0ZC,021L0ZF,021L0ZP,021L0ZQ,021L0ZR,021L0ZW,021L48P,021L48Q,021L48R,021L49P,021L49Q,021 | |

| | | | |
|---|---|---|---|
| | | L49R,021L4AP,021L4AQ,021L4AR,021L4JP,021L4JQ,021L4JR, | |
| | | 021L4KP,021L4KQ,021L4KR,021L4Z5,021L4Z8,021L4Z9,021L4ZC,021L4ZF,021L4ZP,021L4ZQ,021L4ZR,021L4ZW,021V08S,021V08T,021V08U,021V09S,021V09T,021V09U,021V0AS,021V0AT,021V0AU,021V0JS,021V0JT,021V0JU,021V0KS,021V0KT,021V0KU,021V0ZS,021V0ZT,021V0ZU,021V48S,021V48T,021V48U,021V49S,021V49T,021V49U,021V4AS,021V4AT,021V4AU,021V4JS,021V4JT,021V4JU,021V4KS,021V4KT,021V4KU,021V4ZS,021V4ZT,021V4ZU,024F07J,024F08J,024F0JJ,024F0KJ,024G072,024G082,024G0J2,024G0K2,024J072,024J082,024J0J2,024J0K2,02540ZZ,02543ZZ,02544ZZ,02550ZZ,02553ZZ,02554ZZ, | |
| | | 02560ZZ,02563ZZ,02564ZZ,02570ZK,02570ZZ,02573ZK,02573ZZ,02574ZK,02574ZZ,02580ZZ,02583ZZ,02584ZZ,02590ZZ,02593ZZ,02594ZZ,025D0ZZ,025D3ZZ,025D4ZZ,025F0ZZ,025F3ZZ,025F4ZZ,025G0ZZ,025G3ZZ,025G4ZZ,025H0ZZ,025H3ZZ,025H4ZZ,025J0ZZ,025J3ZZ,025J4ZZ,025K0ZZ,025K3ZZ,025K4ZZ,025L0ZZ,025L3ZZ,025L4ZZ,025M0ZZ,025M3ZZ,025M4ZZ,025N0ZZ,025N3ZZ,025N4ZZ,0270046,027004Z,0270056,027005Z,0270066,027006Z,0270076,027007Z,02700D6,027 | |

| | | | |
|---|---|---|---|
| | | 00DZ,02700E6,02700EZ,02700F6,02700FZ,02700G6, | |
| | | 02700GZ,02700T6,02700TZ,02700Z6,02700ZZ,0270346,027034Z,0270356,027035Z,0270366,027036Z,0270376,027037Z,02703D6,02703DZ,02703E6,02703EZ,02703F6,02703FZ,02703G6,02703GZ,02703T6,02703TZ,0270446,027044Z,0270456,027045Z,0270466,027046Z,0270476,027047Z,02704D6,02704DZ,02704E6,02704EZ,02704F6,02704FZ,02704G6,02704GZ,02704T6,02704TZ,0271046,027104Z,0271056,027105Z,0271066,027106Z,0271076,027107Z,02710D6,02710DZ,02710E6,02710EZ,02710F6,02710FZ,02710G6,02710GZ,02710T6,02710TZ,02710Z6,02710ZZ,0271346,027134Z, | |
| | | 0271356,027135Z,0271366,027136Z,0271376,027137Z,02713D6,02713DZ,02713E6,02713EZ,02713F6,02713FZ,02713G6,02713GZ,02713T6,02713TZ,0271446,027144Z,0271456,027145Z,0271466,027146Z,0271476,027147Z,02714D6,02714DZ,02714E6,02714EZ,02714F6,02714FZ,02714G6,02714GZ,02714T6,02714TZ,0272046,027204Z,0272056,027205Z,0272066,027206Z,0272076,027207Z,02720D6,02720DZ,02720E6,02720EZ,02720F6,02720FZ,02720G6,02720GZ,02720T6,02720TZ,02720Z6,02720ZZ, | |

| | | | |
|---|---|---|---|
| | | 0272346,027234Z,0272356,027235Z,0272366,027236Z,0272376,027237Z,02723D6,02723DZ,02723E6,02723EZ,02723F6,02723FZ,02723G6,02723GZ,02723T6,02723TZ,0272446,027244Z,0272456,027245Z,0272466,027246Z,0272476,027247Z,02724D6,02724DZ,02724E6,02724EZ,02724F6,02724FZ,02724G6,02724GZ,02724T6,02724TZ,0273046,027304Z,0273056,027305Z,0273066,027306Z,0273076,027307Z,02730D6,02730DZ,02730E6,02730EZ,02730F6,02730FZ,02730G6,02730GZ,02730T6,02730TZ,02730Z6,02730ZZ,0273346,027334Z,0273356,027335Z,0273366,027336Z,0273376,027337Z,02733D6,02733DZ,02733E6,02733EZ,02733F6,02733FZ, | |
| | | 02733G6,02733GZ,02733T6,02733TZ,0273446,027344Z,0273456,027345Z,0273466,027346Z,0273476,027347Z,02734D6,02734DZ,02734E6,02734EZ,02734F6,02734FZ,02734G6,02734GZ,02734T6,02734TZ,027F04Z,027F0DZ,027F0ZZ,027F34Z,027F3DZ,027F3ZZ,027F44Z,027F4DZ,027F4ZZ,027G04Z,027G0DZ,027G0ZZ,027G34Z,027G3DZ,027G3ZZ,027G44Z,027G4DZ,027G4ZZ,027H04Z,027H0DZ,027H0ZZ,027H34Z,027H3DZ,027H3ZZ,027H44Z,027H4DZ,027H4ZZ,027J04Z,027J0DZ,027J0ZZ,027J34Z,027J3DZ,027J3ZZ,027J44Z,027J4DZ,027J4ZZ,027K04Z,027K0DZ,027K0ZZ, | |

| | | | |
|---|---|---|---|
| | | 027K34Z,027K3DZ,027K3ZZ,027K44Z,027K4DZ,027K4ZZ,027P04Z,027P34Z,027P44Z,027Q04Z,027Q34Z,027Q44Z,027R04T,027R04Z,027R0DT,027R0ZT,027R34T,027R34Z,027R3DT,027R3ZT,027R44T,027R44Z,027R4DT,027R4ZT,027S04Z,027S34Z,027S44Z,027T04Z,027T34Z,027T44Z,027V04Z,027V34Z,027V44Z,027W04Z,027W34Z,027W44Z,027X04Z,027X34Z,027X44Z,02880ZZ,02883ZZ,02884ZZ,02890ZZ,02893ZZ,02894ZZ,028D0ZZ,028D3ZZ,028D4ZZ,02B40ZX,02B40ZZ,02B43ZX,02B43ZZ,02B44ZX,02B44ZZ,02B50ZX,02B50ZZ,02B53ZX,02B53ZZ,02B54ZX,02B54ZZ, | |
| | | 02B60ZX,02B60ZZ,02B63ZX,02B63ZZ,02B64ZX,02B64ZZ,02B70ZK,02B70ZX,02B70ZZ,02B73ZK,02B73ZX,02B73ZZ,02B74ZK,02B74ZX,02B74ZZ,02B80ZX,02B80ZZ,02B83ZX,02B83ZZ,02B84ZX,02B84ZZ,02B90ZX,02B90ZZ,02B93ZX,02B93ZZ,02B94ZX,02B94ZZ,02BD0ZX,02BD0ZZ,02BD3ZX,02BD3ZZ,02BD4ZX,02BD4ZZ,02BF0ZX,02BF0ZZ,02BF3ZX,02BF3ZZ,02BF4ZX,02BF4ZZ,02BG0ZX,02BG0ZZ,02BG3ZX,02BG3ZZ,02BG4ZX,02BG4ZZ,02BH0ZX,02BH0ZZ,02BH3ZX,02BH3ZZ,02BH4ZX,02BH4ZZ,02BJ0ZX,02BJ0ZZ,02BJ3ZX,02BJ3ZZ,02BJ4ZX,02BJ4ZZ,02BK0ZX,02BK0ZZ,02BK3ZX, | |

| | | | |
|---|---|---|---|
| | | 02BK3ZZ,02BK4ZX,02BK4ZZ,<br>02BL0ZX,02BL0ZZ,02BL3ZX,<br>02BL3ZZ,02BL4ZX,02BL4ZZ,<br>02BM0ZX,02BM0ZZ,02BM3Z<br>X,02BM3ZZ,02BM4ZX,02BM4<br>ZZ,02BN0ZX,02BN0ZZ,02BN3<br>ZX,02BN3ZZ,02BN4ZX,02BN<br>4ZZ,02C00Z6,02C00ZZ,02C03<br>Z6,02C03ZZ,02C04Z6,02C04Z<br>Z,02C10Z6,02C10ZZ,02C13Z6,<br>02C13ZZ,02C14Z6,02C14ZZ,0<br>2C20Z6,02C20ZZ,02C23Z6,02<br>C23ZZ,02C24Z6,02C24ZZ,02C<br>30Z6,02C30ZZ,02C33Z6,02C33<br>ZZ,02C34Z6,02C34ZZ,02C40Z<br>Z,02C43ZZ,02C44ZZ,02C50ZZ<br>,02C53ZZ,02C54ZZ,02C60ZZ,0<br>2C63ZZ,02C64ZZ,02C70ZZ,02<br>C73ZZ,02C74ZZ,02C80ZZ,02C<br>83ZZ, | |
| | | 02C84ZZ,02C90ZZ,02C93ZZ,0<br>2C94ZZ,02CD0ZZ,02CD3ZZ,0<br>2CD4ZZ,02CF0ZZ,02CF3ZZ,0<br>2CF4ZZ,02CG0ZZ,02CG3ZZ,0<br>2CG4ZZ,02CH0ZZ,02CH3ZZ,0<br>2CH4ZZ,02CJ0ZZ,02CJ3ZZ,02<br>CJ4ZZ,02CK0ZZ,02CK3ZZ,02<br>CK4ZZ,02CL0ZZ,02CL3ZZ,02<br>CL4ZZ,02CM0ZZ,02CM3ZZ,0<br>2CM4ZZ,02CN0ZZ,02CN3ZZ,<br>02CN4ZZ,02FN0ZZ,02FN3ZZ,<br>02FN4ZZ,02H402Z,02H403Z,0<br>2H40DZ,02H40JZ,02H40KZ,02<br>H40MZ,02H432Z,02H433Z,02<br>H43DZ,02H43JZ,02H43KZ,02<br>H43MZ,02H442Z,02H443Z,02<br>H44DZ,02H44JZ,02H44KZ,02<br>H44MZ,02H602Z,02H603Z,02<br>H60DZ,02H60JZ,02H60KZ,02<br>H60MZ,02H632Z,02H63DZ, | |

| | | | |
|---|---|---|---|
| | | 02H63JZ,02H63KZ,02H63MZ,<br>02H642Z,02H643Z,02H64DZ,0<br>2H64JZ,02H64KZ,02H64MZ,0<br>2H702Z,02H703Z,02H70DZ,02<br>H70JZ,02H70KZ,02H70MZ,02<br>H732Z,02H733Z,02H73DZ,02H<br>73JZ,02H73KZ,02H73MZ,02H<br>742Z,02H743Z,02H74DZ,02H7<br>4JZ,02H74KZ,02H74MZ,02HA<br>0QZ,02HA0RS,02HA0RZ,02H<br>A3QZ,02HA3RS,02HA3RZ,02<br>HA4QZ,02HA4RS,02HA4RZ,0<br>2HK00Z,02HK02Z,02HK03Z,0<br>2HK0DZ,02HK0JZ,02HK0KZ,<br>02HK0MZ,02HK30Z,02HK32Z<br>,02HK3DZ,02HK3JZ,02HK3K<br>Z,02HK3MZ,02HK40Z,02HK4<br>2Z,02HK43Z,02HK4DZ,02HK4<br>JZ,02HK4KZ,02HK4MZ,02HL<br>02Z,02HL03Z,02HL0DZ,02HL<br>0JZ, | |
| | | 02HL0KZ,02HL0MZ,02HL32Z,<br>02HL33Z,02HL3DZ,02HL3JZ,0<br>2HL3KZ,02HL3MZ,02HL42Z,0<br>2HL43Z,02HL4DZ,02HL4JZ,02<br>HL4KZ,02HL4MZ,02HN00Z,0<br>2HN02Z,02HN0JZ,02HN0KZ,0<br>2HN0MZ,02HN30Z,02HN32Z,<br>02HN3JZ,02HN3KZ,02HN3MZ<br>,02HN40Z,02HN42Z,02HN4JZ,<br>02HN4KZ,02HN4MZ,02HW00<br>Z,02HW30Z,02HW40Z,02HX0<br>0Z,02HX30Z,02HX40Z,02JA3Z<br>Z,02JY3ZZ,02K80ZZ,02K83ZZ<br>,02K84ZZ,02L70CK,02L70DK,<br>02L70ZK,02L73CK,02L73DK,<br>02L73ZK,02L74CK,02L74DK,<br>02L74ZK,02LH0CZ,02LH0DZ,<br>02LH0ZZ,02LH3CZ,02LH3DZ,<br>02LH3ZZ,02LH4CZ,02LH4DZ,<br>02LH4ZZ,02LR0ZT,02LS0ZZ, | |

| | | | |
|---|---|---|---|
| | | 02LT0ZZ,02N40ZZ,02N43ZZ,02N44ZZ,02N50ZZ,02N53ZZ,02N54ZZ,02N60ZZ,02N63ZZ,02N64ZZ,02N70ZZ,02N73ZZ,02N74ZZ,02N80ZZ,02N83ZZ,02N84ZZ,02N90ZZ,02N93ZZ,02N94ZZ,02ND0ZZ,02ND3ZZ,02ND4ZZ,02NF0ZZ,02NF3ZZ,02NF4ZZ,02NG0ZZ,02NG3ZZ,02NG4ZZ,02NH0ZZ,02NH3ZZ,02NH4ZZ,02NJ0ZZ,02NJ3ZZ,02NJ4ZZ,02NK0ZZ,02NK3ZZ,02NK4ZZ,02NL0ZZ,02NL3ZZ,02NL4ZZ,02NM0ZZ,02NM3ZZ,02NM4ZZ,02NN0ZZ,02NN3ZZ,02NN4ZZ,02PA02Z,02PA03Z,02PA07Z,02PA08Z,02PA0CZ,02PA0DZ,02PA0JZ,02PA0KZ,02PA0MZ,02PA0QZ,02PA0RZ,02PA32Z,02PA33Z,02PA37Z, | |
| | | 02PA38Z,02PA3CZ,02PA3DZ,02PA3JZ,02PA3KZ,02PA3MZ,02PA3QZ,02PA3RZ,02PA42Z,02PA43Z,02PA47Z,02PA48Z,02PA4CZ,02PA4DZ,02PA4JZ,02PA4KZ,02PA4MZ,02PA4QZ,02PA4RZ,02PAXMZ,02Q00ZZ,02Q03ZZ,02Q04ZZ,02Q10ZZ,02Q13ZZ,02Q14ZZ,02Q20ZZ,02Q23ZZ,02Q24ZZ,02Q30ZZ,02Q33ZZ,02Q34ZZ,02Q40ZZ,02Q43ZZ,02Q44ZZ,02Q50ZZ,02Q53ZZ,02Q54ZZ,02Q60ZZ,02Q63ZZ,02Q64ZZ,02Q70ZZ,02Q73ZZ,02Q74ZZ,02Q80ZZ,02Q83ZZ,02Q84ZZ,02Q90ZZ,02Q93ZZ,02Q94ZZ,02QA0ZZ,02QA3ZZ,02QA4ZZ,02QB0ZZ,02QB3ZZ,02QB4ZZ,02QC0ZZ,02QC3ZZ,02QC4ZZ,02QD0ZZ, | |

| | | | |
|---|---|---|---|
| | | 02QD3ZZ,02QD4ZZ,02QF0ZJ,<br>02QF0ZZ,02QF3ZJ,02QF3ZZ,0<br>2QF4ZJ,02QF4ZZ,02QG0ZE,02<br>QG0ZZ,02QG3ZE,02QG3ZZ,0<br>2QG4ZE,02QG4ZZ,02QH0ZZ,<br>02QH3ZZ,02QH4ZZ,02QJ0ZG,<br>02QJ0ZZ,02QJ3ZG,02QJ3ZZ,0<br>2QJ4ZG,02QJ4ZZ,02QK0ZZ,02<br>QK3ZZ,02QK4ZZ,02QL0ZZ,02<br>QL3ZZ,02QL4ZZ,02QM0ZZ,02<br>QM3ZZ,02QM4ZZ,02QN0ZZ,0<br>2QN3ZZ,02QN4ZZ,02R507Z,0<br>2R508Z,02R50JZ,02R50KZ,02<br>R547Z,02R548Z,02R54JZ,02R5<br>4KZ,02R607Z,02R608Z,02R60J<br>Z,02R60KZ,02R647Z,02R648Z,<br>02R64JZ,02R64KZ,02R707Z,02<br>R708Z,02R70JZ,02R70KZ,02R<br>747Z,02R748Z,02R74JZ,02R74<br>KZ,02R907Z, | |
| | | 02R908Z,02R90JZ,02R90KZ,02<br>R947Z,02R948Z,02R94JZ,02R9<br>4KZ,02RD07Z,02RD08Z,02RD<br>0JZ,02RD0KZ,02RD47Z,02RD<br>48Z,02RD4JZ,02RD4KZ,02RF0<br>7Z,02RF08Z,02RF0JZ,02RF0K<br>Z,02RF37H,02RF37Z,02RF38H<br>,02RF38Z,02RF3JH,02RF3JZ,0<br>2RF3KH,02RF3KZ,02RF47Z,0<br>2RF48Z,02RF4JZ,02RF4KZ,02<br>RG07Z,02RG08Z,02RG0JZ,02<br>RG0KZ,02RG37H,02RG37Z,02<br>RG38H,02RG38Z,02RG3JH,02<br>RG3JZ,02RG3KH,02RG3KZ,02<br>RG47Z,02RG48Z,02RG4JZ,02<br>RG4KZ,02RH07Z,02RH08Z,02<br>RH0JZ,02RH0KZ,02RH37H,02<br>RH37Z,02RH38H,02RH38Z,02<br>RH3JH,02RH3JZ, | |

| | | | |
|---|---|---|---|
| | | 02RH3KH,02RH3KZ,02RH47Z,02RH48Z,02RH4JZ,02RH4KZ,02RJ07Z,02RJ08Z,02RJ0JZ,02RJ0KZ,02RJ47Z,02RJ48Z,02RJ4JZ,02RJ4KZ,02RK07Z,02RK08Z,02RK0JZ,02RK0KZ,02RK47Z,02RK48Z,02RK4JZ,02RK4KZ,02RL07Z,02RL08Z,02RL0JZ,02RL0KZ,02RL47Z,02RL48Z,02RL4JZ,02RL4KZ,02RM07Z,02RM08Z,02RM0JZ,02RM0KZ,02RM47Z,02RM48Z,02RM4JZ,02RM4KZ,02RN07Z,02RN08Z,02RN0JZ,02RN0KZ,02RN47Z,02RN48Z,02RN4JZ,02RN4KZ,02RP0JZ,02RQ07Z,02RQ0JZ,02RR07Z,02RR0JZ,02S00ZZ,02S10ZZ,02SP0ZZ,02SW0ZZ,02SX0ZZ,02T50ZZ,02T53ZZ,02T54ZZ,02T80ZZ,02T83ZZ,02T84ZZ,02T90ZZ,02T93ZZ,02T94ZZ,02TD0ZZ,02TD3ZZ,02TD4ZZ, | |
| | | 02TH0ZZ,02TH3ZZ,02TH4ZZ,02TM0ZZ,02TM3ZZ,02TM4ZZ,02TN0ZZ,02TN3ZZ,02TN4ZZ,02U507Z,02U508Z,02U50JZ,02U50KZ,02U537Z,02U538Z,02U53JZ,02U53KZ,02U547Z,02U548Z,02U54JZ,02U54KZ,02U607Z,02U608Z,02U60JZ,02U60KZ,02U637Z,02U638Z,02U63JZ,02U63KZ,02U647Z,02U648Z,02U64JZ,02U64KZ,02U707Z,02U708Z,02U70JZ,02U70KZ,02U737Z,02U738Z,02U73JZ,02U73KZ,02U747Z,02U748Z,02U74JZ,02U74KZ,02U907Z,02U908Z,02U90JZ,02U90KZ,02U937Z,02U938Z,02U93JZ,02U93KZ,02U947Z,02U948Z,02U94JZ,02U94KZ,02UA07Z,02UA08Z,02UA0JZ,02UA0KZ,02UA37Z,02UA38Z,02UA3JZ,02UA3KZ,02UA47Z,02UA48Z,02UA4JZ,02UA4KZ,02UD07Z,02UD08Z,02UD0JZ,02UD0KZ,02UD37Z,02U | |

| | | | |
|---|---|---|---|
| | | D38Z,02UD3JZ, | |
| | | 02UD3KZ,02UD47Z,02UD48Z,<br>02UD4JZ,02UD4KZ,02UF07J,0<br>2UF07Z,02UF08J,02UF08Z,02<br>UF0JJ,02UF0JZ,02UF0KJ,02U<br>F0KZ,02UF37J,02UF37Z,02UF<br>38J,02UF38Z,02UF3JJ,02UF3J<br>Z,02UF3KJ,02UF3KZ,02UF47J<br>,02UF47Z,02UF48J,02UF48Z,0<br>2UF4JJ,02UF4JZ,02UF4KJ,02U<br>F4KZ,02UG07E,02UG07Z,02U<br>G08E,02UG08Z,02UG0JE,02U<br>G0JZ,02UG0KE,02UG0KZ,02<br>UG37E,02UG37Z,02UG38E,02<br>UG38Z,02UG3JE,02UG3JZ,02<br>UG3KE,02UG3KZ,02UG47E,0<br>2UG47Z,02UG48E,02UG48Z,0<br>2UG4JE,02UG4JZ,02UG4KE,0<br>2UG4KZ,02UH07Z,02UH08Z,0<br>2UH0JZ,02UH0KZ,02UH37Z,0<br>2UH38Z,02UH3JZ,02UH3KZ,0<br>2UH47Z,02UH48Z,02UH4JZ,0<br>2UH4KZ,02UJ07G,02UJ07Z,02<br>UJ08G,02UJ08Z,02UJ0JG,02UJ<br>0JZ,02UJ0KG,02UJ0KZ,02UJ3<br>7G,02UJ37Z,02UJ38G, | |

| | | | |
|---|---|---|---|
| | | 02UJ38Z,02UJ3JG,02UJ3JZ,02UJ3KG,02UJ3KZ,02UJ47G,02UJ47Z,02UJ48G,02UJ48Z,02UJ4JG,02UJ4JZ,02UJ4KG,02UJ4KZ,02UK07Z,02UK08Z,02UK0JZ,02UK0KZ,02UK37Z,02UK38Z,02UK3JZ,02UK3KZ,02UK47Z,02UK48Z,02UK4JZ,02UK4KZ,02UL07Z,02UL08Z,02UL0JZ,02UL0KZ,02UL37Z,02UL38Z,02UL3JZ,02UL3KZ,02UL47Z,02UL48Z,02UL4JZ,02UL4KZ,02UM07Z,02UM08Z,02UM0JZ,02UM0KZ,02UM37Z,02UM38Z,02UM3JZ,02UM3KZ,02UM47Z,02UM48Z,02UM4JZ,02UM4KZ,02UN07Z,02UN08Z,02UN0JZ,02UN0KZ,02UN37Z,02UN38Z,02UN3JZ,02UN3KZ,02UN47Z,02UN48Z,02UN4JZ,02UN4KZ,02VA0CZ,02VA0ZZ,02VA3CZ,02VA3ZZ,02VA4CZ,02VA4ZZ,02VR0ZT,02W50JZ,02W54JZ,02WA02Z,02WA03Z,02WA07Z,02WA08Z,02WA0CZ,02WA0DZ,02WA0JZ,02WA0KZ,02WA0MZ,02WA0QZ,02WA0RZ,02WA32Z,02WA33Z,02WA37Z,02WA38Z,02WA3CZ, | |
| | | 02WA3DZ,02WA3JZ,02WA3KZ,02WA3MZ,02WA3QZ,02WA3RZ,02WA42Z,02WA43Z,02WA47Z,02WA48Z,02WA4CZ,02WA4DZ,02WA4JZ,02WA4KZ,02WA4MZ,02WA4QZ,02WA4RZ,02WF07Z,02WF08Z,02WF0JZ,02WF0KZ,02WF47Z,02WF48Z,02WF4JZ,02WF4KZ,02WG07Z,02WG08Z,02WG0JZ,02WG0KZ,02WG47Z,02WG48Z,02WG4JZ,02WG4KZ,02WH07Z,02WH08Z,02WH0JZ,02WH0KZ,02WH47Z,02WH48Z,02WH4JZ,02WH4KZ,02WJ07Z,02WJ08Z,02WJ0JZ,02WJ0KZ,02WJ47Z,02WJ48Z,02WJ4JZ,02WJ4KZ,02WM0JZ,02WM4JZ,0 | |

| | | | |
|---|---|---|---|
| | | 2YA0Z0,02YA0Z1,02YA0Z2,0370046,037004Z,0370056,037005Z,0370066,037006Z,0370076,037007Z, | |
| | | 0370346,037034Z,0370356,037035Z,0370366,037036Z,0370376,037037Z,0370446,037044Z,0370456,037045Z,0370466,037046Z,0370476,037047Z,0371046,037104Z,0371056,037105Z,0371066,037106Z,0371076,037107Z,0371346,037134Z,0371356,037135Z,0371366,037136Z,0371376,037137Z,0371446,037144Z,0371456,037145Z,0371466,037146Z,0371476,037147Z,0372046,037204Z,0372056,037205Z,0372066,037206Z,0372076,037207Z,0372346,037234Z,0372356,037235Z,0372366,037236Z,0372376,037237Z,0372446,037244Z,0372456,037245Z,0372466,037246Z,0372476,037247Z,0373046,037304Z, | |
| | | 0373056,037305Z,0373066,037306Z,0373076,037307Z,0373346,037334Z,0373356,037335Z,0373366,037336Z,0373376,037337Z,0373446,037344Z,0373456,037345Z,0373466,037346Z,0373476,037347Z,0374046,037404Z,0374056,037405Z,0374066,037406Z,0374076,037407Z,0374346,037434Z,0374356,037435Z,0374366,037436Z,0374376,037437Z,0374446,037444Z,0374456,037445Z,0374466,037446Z,0374476,037447Z,0375046,037504Z,0375056,037505Z,0375066,037506Z,0375076,037507Z,037534 | |

| | | | |
|---|---|---|---|
| | | 6,037534Z,0375356,037535Z,037536Z,0375376,037537Z,0375446,037544Z,0375456,037545Z,0375466, | |
| | | 037546Z,0375476,037547Z,0376046,037604Z,0376056,037605Z,0376066,037606Z,0376076,037607Z,0376346,037634Z,0376356,037635Z,0376366,037636Z,0376376,037637Z,0376446,037644Z,0376456,037645Z,0376466,037646Z,0376476,037647Z,0377046,037704Z,0377056,037705Z,0377066,037706Z,0377076,037707Z,0377346,037734Z,0377356,037735Z,0377366,037736Z,0377376,037737Z,0377446,037744Z,0377456,037745Z,0377466,037746Z,0377476,037747Z,0378046,037804Z,0378056,037805Z,0378066,037806Z,0378076,037807Z,0378346,037834Z,0378356,037835Z,0378366,037836Z,0378376,037837Z,0378446,037844Z,0378456,037845Z,0378466,037846Z,0378476,037847Z,0379046,037904Z,0379056, | |
| | | 037905Z,0379066,037906Z,0379076,037907Z,0379346,037934Z,0379356,037935Z,0379366,037936Z,0379376,037937Z,0379446,037944Z,0379456,037945Z,0379466,037946Z,0379476,037947Z,037A046,037A04Z,037A056,037A05Z,037A066,037A06Z,037A076,037A07Z,037A346,037A34Z,037A356,037A35Z,037A366,037A36Z,037A376,037A37Z,037A446,037A44Z,037A456,037A45Z,037A466,037A46Z,037A476,037A47Z,037B046,03 | |

| | | | |
|---|---|---|---|
| | | 7B04Z,037B056,037B05Z,037B066,037B06Z,037B076,037B07Z,037B346,037B34Z,037B356,037B35Z,037B366,037B36Z,037B376,037B37Z,037B446,037B44Z,037B456,037B45Z,037B466,037B46Z, | |
| | | 037B476,037B47Z,037C046,037C04Z,037C056,037C05Z,037C066,037C06Z,037C076,037C07Z,037C346,037C34Z,037C356,037C35Z,037C366,037C36Z,037C376,037C37Z,037C446,037C44Z,037C456,037C45Z,037C466,037C46Z,037C476,037C47Z,037D046,037D04Z,037D056,037D05Z,037D066,037D06Z,037D076,037D07Z,037D346,037D34Z,037D356,037D35Z,037D366,037D36Z,037D376,037D37Z,037D446,037D44Z,037D456,037D45Z,037D466,037D46Z,037D476,037D47Z,037F046,037F04Z,037F056,037F05Z,037F066,037F06Z,037F076,037F07Z,037F346,037F34Z,037F356,037F35Z,037F366,037F36Z,037F376,037F37Z, | |
| | | 037F446,037F44Z,037F456,037F45Z,037F466,037F46Z,037F476,037F47Z,037G046,037G04Z,037G056,037G05Z,037G066,037G06Z,037G076,037G07Z,037H046,037H04Z,037H056,037H05Z,037H066,037H06Z,037H076,037H07Z,037H346,037H34Z,037H356,037H35Z,037H366,037H36Z,037H376,037H37Z,037H446,037H44Z,037H456,037H45Z,037H466,037H46Z,037H476,037H47Z,037J046,037J04Z,037J056,037J05Z,037J066,037J06Z,037J076,037J07Z,037J346,037J34Z,037J356,037J35Z,037J366, | |

| | | | |
|---|---|---|---|
| | | 037J36Z,037J376,037J37Z,037J446,037J44Z,037J456,037J45Z,037J466,037J46Z,037J476,037J47Z,037K046,037K04Z,037K056,037K05Z, | |
| | | 037K066,037K06Z,037K076,037K07Z,037K346,037K34Z,037K356,037K35Z,037K366,037K36Z,037K376,037K37Z,037K446,037K44Z,037K456,037K45Z,037K466,037K46Z,037K476,037K47Z,037L046,037L04Z,037L056,037L05Z,037L066,037L06Z,037L076,037L07Z,037L346,037L34Z,037L356,037L35Z,037L366,037L36Z,037L376,037L37Z,037L446,037L44Z,037L456,037L45Z,037L466,037L46Z,037L476,037L47Z,037M046,037M04Z,037M056,037M05Z,037M066,037M06Z,037M076,037M07Z,037M346,037M34Z,037M356,037M35Z,037M366,037M36Z,037M376,037M37Z,037M446,037M44Z,037M456,037M45Z,037M466, | |
| | | 037M46Z,037M476,037M47Z,037N046,037N04Z,037N056,037N05Z,037N066,037N06Z,037N076,037N07Z,037N346,037N34Z,037N356,037N35Z,037N366,037N36Z,037N376,037N37Z,037N446,037N44Z,037N456,037N45Z,037N466,037N46Z,037N476,037N47Z,037P046,037P04Z,037P056,037P05Z,037P066,037P06Z,037P076,037P07Z,037P346,037P34Z,037P356,037P35Z,037P366,037P36Z,037P376,037P37Z,037P446,037P44Z,037P456,037P45Z,037P466,037P46Z,037P476,037P47Z,037Q046,037 | |

| | | | |
|---|---|---|---|
| | | Q04Z,037Q056,037Q05Z,037Q066,037Q06Z,037Q076,037Q07Z,037Q346,037Q34Z,037Q356,037Q35Z,037Q366,037Q36Z,037Q376, | |
| | | 037Q37Z,037Q446,037Q44Z,037Q456,037Q45Z,037Q466,037Q46Z,037Q476,037Q47Z,037R046,037R04Z,037R056,037R05Z,037R066,037R06Z,037R076,037R07Z,037R346,037R34Z,037R356,037R35Z,037R366,037R36Z,037R376,037R37Z,037R446,037R44Z,037R456,037R45Z,037R466,037R46Z,037R476,037R47Z,037S046,037S04Z,037S056,037S05Z,037S066,037S06Z,037S076,037S07Z,037S346,037S34Z,037S356,037S35Z,037S366,037S36Z,037S376,037S37Z,037S446,037S44Z,037S456,037S45Z,037S466,037S46Z,037S476, | |
| | | 037S47Z,037T046,037T04Z,037T056,037T05Z,037T066,037T06Z,037T076,037T07Z,037T346,037T34Z,037T356,037T35Z,037T366,037T36Z,037T376,037T37Z,037T446,037T44Z,037T456,037T45Z,037T466,037T46Z,037T476,037T47Z,037U046,037U04Z,037U056,037U05Z,037U066,037U06Z,037U076,037U07Z,037U346,037U34Z,037U356,037U35Z,037U366,037U36Z,037U376,037U37Z,037U446,037U44Z,037U456,037U45Z,037U466,037U46Z,037U476,037U47Z,037V046,037V04Z,037V056,037V05Z,037V066,037V06Z,037V076,037V07Z,037V346,037V34Z,037V356,037V35Z,037V366,037V36Z,037V376,037V | |

| | | | |
|---|---|---|---|
| | | 37Z,037V446, | |
| | | 037V44Z,037V456,037V45Z,037V466,037V46Z,037V476,037V47Z,037Y046,037Y04Z,037Y056,037Y05Z,037Y066,037Y06Z,037Y076,037Y07Z,037Y346,037Y34Z,037Y356,037Y35Z,037Y366,037Y36Z,037Y376,037Y37Z,037Y446,037Y44Z,037Y456,037Y45Z,037Y466,037Y46Z,037Y476,037Y47Z,0470046,047004Z,0470056,047005Z,0470066,047006Z,0470076,047007Z,0470346,047034Z,0470356,047035Z,0470366,047036Z,0470376,047037Z,0470446,047044Z,0470456,047045Z,0470466,047046Z,0470476,047047Z,0471046,047104Z,0471056,047105Z,0471066,047106Z,0471076,047107Z,0471346,047134Z,0471356, | |
| | | 047135Z,0471366,047136Z,0471376,047137Z,0471446,047144Z,0471456,047145Z,0471466,047146Z,0471476,047147Z,0472046,047204Z,0472056,047205Z,0472066,047206Z,0472076,047207Z,0472346,047234Z,0472356,047235Z,0472366,047236Z,0472376,047237Z,0472446,047244Z,0472456,047245Z,0472466,047246Z,0472476,047247Z,0473046,047304Z,0473056,047305Z,0473066,047306Z,0473076,047307Z,0473346,047334Z,0473356,047335Z,0473366,047336Z,0473376,047337Z,0473446,047344Z,0473456,047345Z,0473466,04 | |

| | | | |
|---|---|---|---|
| | | 7346Z,0473476,047347Z,04740<br>46,047404Z,0474056,047405Z,0<br>474066,047406Z,0474076, | |
| | | 047407Z,0474346,047434Z,047<br>4356,047435Z,0474366,047436<br>Z,0474376,047437Z,0474446,04<br>7444Z,0474456,047445Z,04744<br>66,047446Z,0474476,047447Z,0<br>475046,047504Z,0475056,0475<br>05Z,0475066,047506Z,0475076,<br>047507Z,0475346,047534Z,047<br>5356,047535Z,0475366,047536<br>Z,0475376,047537Z,0475446,04<br>7544Z,0475456,047545Z,04754<br>66,047546Z,0475476,047547Z,0<br>476046,047604Z,0476056,0476<br>05Z,0476066,047606Z,0476076,<br>047607Z,0476346,047634Z,047<br>6356,047635Z,0476366,047636<br>Z,0476376,047637Z,0476446,04<br>7644Z,0476456,047645Z,04764<br>66,047646Z,0476476,047647Z,0<br>477046,047704Z,0477056,0477<br>05Z,0477066,047706Z,0477076,<br>047707Z,0477346,047734Z,047<br>7356,047735Z,0477366, | |
| | | 047736Z,0477376,047737Z,047<br>7446,047744Z,0477456,047745<br>Z,0477466,047746Z,0477476,04<br>7747Z,0478046,047804Z,04780<br>56,047805Z,0478066,047806Z,0<br>478076,047807Z,0478346,0478<br>34Z,0478356,047835Z,0478366,<br>047836Z,0478376,047837Z,047<br>8446,047844Z,0478456,047845<br>Z,0478466,047846Z,0478476,04<br>7847Z,0479046,047904Z,04790<br>56,047905Z,0479066,047906Z,0<br>479076,047907Z,0479346,0479<br>34Z,0479356,047935Z,0479366, | |

| | | | |
|---|---|---|---|
| | | 047936Z,0479376,047937Z,0479446,047944Z,0479456,047945Z,0479466,047946Z,0479476,047947Z,047A046,047A04Z,047A056,047A05Z,047A066,047A06Z,047A076,047A07Z,047A346,047A34Z,047A356,047A35Z,047A366,047A36Z,047A376,047A37Z,047A446,047A44Z, | |
| | | 047A456,047A45Z,047A466,047A46Z,047A476,047A47Z,047B046,047B04Z,047B056,047B05Z,047B066,047B06Z,047B076,047B07Z,047B346,047B34Z,047B356,047B35Z,047B366,047B36Z,047B376,047B37Z,047B446,047B44Z,047B456,047B45Z,047B466,047B46Z,047B476,047B47Z,047C046,047C04Z,047C056,047C05Z,047C066,047C06Z,047C076,047C07Z,047C346,047C34Z,047C356,047C35Z,047C366,047C36Z,047C376,047C37Z,047C446,047C44Z,047C456,047C45Z,047C466,047C46Z,047C476,047C47Z,047D046,047D04Z,047D056,047D05Z,047D066,047D06Z,047D076,047D07Z,047D346,047D34Z,047D356,047D35Z,047D366, | |
| | | 047D36Z,047D376,047D37Z,047D446,047D44Z,047D456,047D45Z,047D466,047D46Z,047D476,047D47Z,047E046,047E04Z,047E056,047E05Z,047E066,047E06Z,047E076,047E07Z,047E346,047E34Z,047E356,047E35Z,047E366,047E36Z,047E376,047E37Z,047E446,047E44Z,047E456,047E45Z,047E466,047E46Z,047E476,047E47Z,047F046,047F04Z,047F056,047F05Z,047F066,047F06Z,047F076,047F07Z,047F346,047F34Z,047F356,047F35Z,047F366,047F36Z,04 | |

| | | | |
|---|---|---|---|
| | | 7F376,047F37Z,047F446,047F44Z,047F456,047F45Z,047F466,047F46Z,047F476,047F47Z,047H046,047H04Z,047H056,047H05Z,047H066,047H06Z,047H076,047H07Z,047H346,047H34Z,047H356,047H35Z,047H366,047H36Z,047H376,047H37Z,047H446, | |
| | | 047H44Z,047H456,047H45Z,047H466,047H46Z,047H476,047H47Z,047J046,047J04Z,047J056,047J05Z,047J066,047J06Z,047J076,047J07Z,047J346,047J34Z,047J356,047J35Z,047J366,047J36Z,047J376,047J37Z,047J446,047J44Z,047J456,047J45Z,047J466,047J46Z,047J476,047J47Z,047K041,047K046,047K04Z,047K056,047K05Z,047K066,047K06Z,047K076,047K07Z,047K341,047K346,047K34Z,047K356,047K35Z,047K366,047K36Z,047K376,047K37Z,047K441,047K446,047K44Z,047K456,047K45Z,047K466,047K46Z,047K476,047K47Z,047L041,047L046,047L04Z,047L056,047L05Z,047L066,047L06Z,047L076,047L07Z,047L341,047L346,047L34Z, | |
| | | 047L356,047L35Z,047L366,047L36Z,047L376,047L37Z,047L441,047L446,047L44Z,047L456,047L45Z,047L466,047L46Z,047L476,047L47Z,047M041,047M046,047M04Z,047M056,047M05Z,047M066,047M06Z,047M076,047M07Z,047M341,047M346,047M34Z,047M356,047M35Z,047M366,047M36Z,047M376,047M37Z,047M441,047M446,047M44Z,047M456,047M45Z,047M466,047M46Z,047M476,047M47Z,047N041,047N | |

| | | | |
|---|---|---|---|
| | | 046,047N04Z,047N056,047N05Z,047N066,047N06Z,047N076,047N07Z,047N341,047N346,047N34Z,047N356,047N35Z,047N366,047N36Z,047N376,047N37Z,047N441,047N446,047N44Z,047N456, | |
| | | 047N45Z,047N466,047N46Z,047N476,047N47Z,047P046,047P04Z,047P056,047P05Z,047P066,047P06Z,047P076,047P07Z,047P346,047P34Z,047P356,047P35Z,047P366,047P36Z,047P376,047P37Z,047P446,047P44Z,047P456,047P45Z,047P466,047P46Z,047P476,047P47Z,047Q046,047Q04Z,047Q056,047Q05Z,047Q066,047Q06Z,047Q076,047Q07Z,047Q346,047Q34Z,047Q356,047Q35Z,047Q366,047Q36Z,047Q376,047Q37Z,047Q446,047Q44Z,047Q456,047Q45Z,047Q466,047Q46Z,047Q476,047Q47Z,047R046,047R04Z,047R056,047R05Z,047R066,047R06Z,047R076,047R07Z,047R346,047R34Z,047R356,047R35Z,047R366,047R36Z,047R376,047R37Z,047R446,047R44Z,047R456,047R45Z,047R466,047R46Z,047R476,047R47Z, | |
| | | 047S046,047S04Z,047S056,047S05Z,047S066,047S06Z,047S076,047S07Z,047S346,047S34Z,047S356,047S35Z,047S366,047S36Z,047S376,047S37Z,047S446,047S44Z,047S456,047S45Z,047S466,047S46Z,047S476,047S47Z,047T046,047T04Z,047T056,047T05Z,047T066,047T06Z,047T076,047T07Z,047T346,047T34Z,047T356,047T35Z,047T366,047T36Z,047T376,047T37Z,047T446,047T44Z,047T456,047 | |

| | | | |
|---|---|---|---|
| | | T45Z,047T466,047T46Z,047T476,047T47Z,047U046,047U04Z,047U056,047U05Z,047U066,047U06Z,047U076,047U07Z,047U346,047U34Z,047U356,047U35Z,047U366,047U36Z,047U376,047U37Z,047U446,047U44Z,047U456,047U45Z,047U466,047U46Z,047U476,047U47Z,047V046,047V04Z,047V056,047V05Z,047V066,047V06Z,047V076,047V07Z,047V346,047V34Z,047V356,047V35Z,047V366,047V36Z,047V376,047V37Z, | |
| | | 047V446,047V44Z,047V456,047V45Z,047V466,047V46Z,047V476,047V47Z,047W046,047W04Z,047W056,047W05Z,047W066,047W06Z,047W076,047W07Z,047W346,047W34Z,047W356,047W35Z,047W366,047W36Z,047W376,047W37Z,047W446,047W44Z,047W456,047W45Z,047W466,047W46Z,047W476,047W47Z,047Y046,047Y04Z,047Y056,047Y05Z,047Y066,047Y06Z,047Y076,047Y07Z,047Y346,047Y34Z,047Y356,047Y35Z,047Y366,047Y36Z,047Y376,047Y37Z,047Y446,047Y44Z,047Y456,047Y45Z,047Y466,047Y46Z,047Y476,047Y47Z,04H002Z,04H032Z,04H042Z,0JH600Z,0JH602Z,0JH604Z,0JH605Z,0JH606Z,0JH607Z, | |
| | | 0JH608Z,0JH609Z,0JH60PZ,0JH630Z,0JH632Z,0JH634Z,0JH635Z,0JH636Z,0JH637Z,0JH638Z,0JH639Z,0JH63PZ,0JH800Z,0JH804Z,0JH805Z,0JH806Z,0JH807Z,0JH808Z,0JH809Z,0JH80PZ,0JH830Z,0JH834Z,0JH835Z,0JH836Z,0JH837Z,0JH838Z,0JH839Z,0JH83PZ,0JPT0PZ,0JPT3PZ,0JWT02Z,0JWT0PZ,0JWT32Z,0JWT3PZ,0W9D00Z,0W9D0ZX,0W9D0ZZ,0W9D30Z | |

| | | | |
|---|---|---|---|
| | | ,0W9D3ZX,0W9D3ZZ,0W9D40Z,0W9D4ZX,0W9D4ZZ,0WCD0ZZ,0WCD3ZZ,0WCD4ZZ,0WFD0ZZ,0WFD3ZZ,0WFD4ZZ,0WFDXZZ,0WHD03Z,0WHD0YZ,0WHD33Z,0WHD3YZ,0WHD43Z,0WHD4YZ,0WJD0ZZ,0WJD3ZZ,0WPD00Z,0WPD01Z,0WPD03Z,0WPD0YZ,0WPD30Z,0WPD31Z, | |
| | | 0WPD33Z,0WPD3YZ,0WPD40Z,0WPD41Z,0WPD43Z,0WPD4YZ,0WWD00Z,0WWD01Z,0WWD03Z,0WWD0YZ,0WWD30Z,0WWD31Z,0WWD33Z,0WWD3YZ,0WWD40Z,0WWD41Z,0WWD43Z,0WWD4YZ,3E053KZ,3E063KZ,3E07017,3E070GC,3E070KZ,3E070PZ,3E07317,3E073GC,3E073KZ,3E073PZ,3E080GC,3E080KZ,3E083GC,3E083KZ,4A020N6,4A020N7,4A020N8,4A023FZ,4A023N6,4A023N7,4A023N8,4A02X4Z,4A02XFZ,4A030BC,4A033BC,4A130BC,4A133BC,5A02110,5A02116,5A0211D,5A02210,5A02216,5A0221D,5A1213Z,5A1223Z,B244YZZ,B244ZZZ,B245YZZ,B245ZZZ,B246YZZ,B246ZZZ,B24DYZZ,B24DZZZ,X2RF032,X2RF332,X2RF432 | |

# ANNEX 2. ENCEPP CECKLIST FOR STUDY PROTOCOLS

*N/A*

# ANNEX 3. ADDITIONAL INFORMATION

*N/A*

**APPROVAL / SIGNATURE PAGE**

**Document Number: c14336616** **Technical Version Number:1.0**

**Document Name:** 1160-0274-final-protocol

**Title:** The Comparative Safety and Effectiveness of dabigatran, versus rivaroxaban, and apixaban Utilized in the Department of Defense (DoD) Non-Valvular Atrial Fibrillation Patient Population-A Retrospective Database Analysis

**Signatures (obtained electronically)**

| Meaning of Signature | Signed by | Date Signed |
|---|---|---|
| Approval-Clinical [redacted] | [redacted] | 17 Dec 2016 21:07 CET |

**(Continued) Signatures (obtained electronically)**

| Meaning of Signature | Signed by | Date Signed |
|---|---|---|