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The following report(s) provides findings from an FDA-initiated query using Sentinel. While Sentinel queries may be undertaken to assess potential medical product safety risks, they may also be initiated for various other reasons. Some examples include determining a rate or count of an identified health outcome of interest, examining medical product use, exploring the feasibility of future, more detailed analyses within Sentinel, and seeking to better understand Sentinel capabilities.

Data obtained through Sentinel are intended to complement other types of evidence such as preclinical studies, clinical trials, postmarket studies, and adverse event reports, all of which are used by FDA to inform regulatory decisions regarding medical product safety. The information contained in this report is provided as part of FDA's commitment to place knowledge acquired from Sentinel in the public domain as soon as possible. Any public health actions taken by FDA regarding products involved in Sentinel queries will continue to be communicated through

FDA wants to emphasize that the fact that FDA has initiated a query involving a medical product and is reporting findings related to that query does not mean that FDA is suggesting health care practitioners should change their prescribing practices for the medical product or that patients taking the medical product should stop using it. Patients who have questions about the use of an identified medical product should contact their health care

The following report contains a description of the request, request specifications, and results from the modular program run(s).

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Overview for Request cder_mpl1r_wp119 (Report 1 of 2)

Request ID: cder_mpl1r_wp119

Request Description: The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21-64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

Sentinel Routine Querying Module: Cohort Identification and Descriptive Analysis (CIDA) module, version 7.0.1

Data Source: The study period spanned from October 19, 2010 to September 30, 2015 and included data from 16 Data Partners contributing to the SDD. This request was distributed on January 11, 2019. See Appendix A for a list of the latest dates of available data for each Data Partner.

Study Design: The request was designed to identify new initiators of NOACs in the SDD. The number of qualifying patients with the exposures of interest was calculated overall and by age group.

Exposures of Interest: The exposures of interest were apixaban 2.5 mg, apixaban 5 mg, dabigatran 75 mg, dabigatran 150 mg, rivaroxaban 10 mg, rivaroxaban 15mg, and rivaroxaban 20 mg. All exposures were defined using National Drug Codes (NDCs). Please see Appendix B for generic and brand names of medical products used to define exposure of interest in this request.

Cohort Eligibility Criteria: Cohort members were required to be continuously enrolled in plans with medical and drug coverage for at least 183 days prior to their index dispensing date, during which gaps in coverage of up to 45 days were allowed. Members were required to have no evidence of apixaban, dabigatran, rivaroxaban, or warfarin use, as well as no evidence of an inpatient diagnosis for ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, or other extracranial bleeding in the 183 days preceding their index date. Finally, members were required to be between the ages of 21 and 64 years. There were five sensitivity analyses for apixaban 2.5 and rivaroxaban 10 mg exposure groups:

1) Require evidence of an atrial fibrillation diagnosis on index date or up to 183 days prior to index.
2) Require evidence of an atrial fibrillation diagnosis and no evidence of a pulmonary embolism or deep vein thrombosis diagnosis on index date or up to 183 days prior to index.
3) Require no evidence of an atrial fibrillation diagnosis and evidence of a pulmonary embolism or deep vein thrombosis diagnosis on index date or up to 183 days prior to index.
4) Require no evidence of an atrial fibrillation, pulmonary embolism, or deep vein thrombosis diagnosis on index date or up to 183 days prior to index.
5) Require evidence of hip, knee, or spinal surgery on index date or up to 183 days prior to index.

Only a member's first qualifying dispensing that occurred between October 19, 2010 to September 3, 2015 was included. In the main analysis, if a second dispensing occurred within 3 days from the last day of the first dispensing, then the episode was bridged and the two dispensings were considered part of the same episode. Each episode was extended by 3 days. In the sensitivity analysis, if a second dispensing occurred within 14 days from the last day of the first dispensing, then the episode was bridged and the two dispensings were considered part of the same episode. Each episode was extended by 14 days.

Baseline Covariates: The following covariates were assessed from the index date through the 183 days prior to index: comorbidity score, health service utilization, atrial fibrillation (AF), AF with no evidence of pulmonary embolism (PE) or deep vein thrombosis (DVT), PE or DVT with no evidence of AF, neither AF nor DTV or PE, institutional stay, hip surgery, knee surgery, spinal surgery, dialysis, joint replacement, kidney transplant, mitral stenosis, valve repair, valve replacement, bleeding event in the ambulatory or other ambutatory care setting, and bleeding event in the ambulatory, other ambulatory, or emergency department care settings. Age, gender and calendar year of index drug initiation was examined on index date. Please refer to Appendix D for specific codes used to define covariates.

Please see Appendix E for the specifications of parameters to be used in the analyses for this request.

Limitations: Algorithms used to define exposures and inclusion and exclusion criteria are imperfect; thus, it is possible that there may be misclassification. Therefore, data should be interpreted with these limitations in mind.

Notes: Please contact the Sentinel Operations Center (info@sentinelsystem.org) for questions and to provide comments or suggestions for future enhancements to this document.

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Glossary of Terms for Analyses Using
Cohort Identification and Descriptive Analysis (CIDA) Tool*

Amount Supplied - number of units (pills, tablets, vials) dispensed. Net amount per NDC per dispensing.
Blackout Period - number of days at the beginning of a treatment episode that events are to be ignored. If an event occurs during the blackout period, the episode is excluded.
Care Setting - type of medical encounter or facility where the exposure, event, or condition code was recorded. Possible care settings include: Inpatient Hospital Stay (IP), Non-Acute Institutional Stay (IS), Emergency Department (ED), Ambulatory Visit (AV), and Other Ambulatory Visit (OA). For laboratory results, possible care settings include: Emergency Department (E), Home (H), Inpatient (I), Outpatient (O), or Unknown or Missing (U). The Care Setting, along with the Principal Diagnosis Indicator (PDX), forms the Care Setting/PDX parameter.

- **Ambulatory Visit (AV) -** includes visits at outpatient clinics, same-day surgeries, urgent care visits, and other same-day ambulatory hospital encounters, but excludes emergency department encounters.
- **Emergency Department (ED) -** includes ED encounters that become inpatient stays (in which case inpatient stays would be a separate encounter). Excludes urgent care visits.
- **Inpatient Hospital Stay (IP) -** includes all inpatient stays, same-day hospital discharges, hospital transfers, and acute hospital care where the discharge is after the admission date.
- **Non-Acute Institutional Stay (IS) -** includes hospice, skilled nursing facility (SNF), rehab center, nursing home, residential, overnight non-hospital dialysis and other non-hospital stays.
- **Other Ambulatory Visit (OA) -** includes other non overnight AV encounters such as hospice visits, home health visits, skilled nursing facility visits, other non-hospital visits, as well as telemedicine, telephone and email consultations.

Charlson/Elixhauser Combined Comorbidity Score - calculated based on comorbidities observed during a requester-defined window around the exposure episode start date (e.g., in the 183 days prior to index).
Cohort Definition (drug/exposure) - indicates how the cohort will be defined: 01: Cohort includes only the first valid treatment episode during the query period; 02: Cohort includes all valid treatment episodes during the query period; 03: Cohort includes all valid treatment episodes during the query period until an event occurs.
Days Supplied - number of days supplied for all dispensings in qualifying treatment episodes.
Eligible Members - number of members eligible for an incident treatment episode (defined by the drug/exposure and event washout periods) with drug and medical coverage during the query period.
Enrollment Gap - number of days allowed between two consecutive enrollment periods without breaking a “continuously enrolled” sequence.
Episodes - treatment episodes; length of episode is determined by days supplied in one dispensing or consecutive dispensings bridged by the episode gap.
Episode Gap - number of days allowed between two (or more) consecutive exposures (dispensings/procedures) to be considered the same treatment episode.
Event Deduplication - specifies how events are counted by the Modular Program (MP) algorithm: 0: Counts all occurrences of a health outcome of interest (HOI) during an exposure episode; 1: de-duplicates occurrences of the same HOI code and code type on the same day; 2: de-duplicates occurrences of the same HOI group on the same day (e.g., de-duplicates at the group level).
Exposure Episode Length - number of days after exposure initiation that is considered "exposed time."
Exposure Extension Period - number of days post treatment period in which the outcomes/events are counted for a treatment episode. Extensions are added after any episode gaps have been bridged.
Lookback Period - number of days wherein a member is required to have evidence of pre-existing condition (diagnosis/procedure/drug dispensing).
Maximum Episode Duration - truncates exposure episodes after a requester-specified number of exposed days. Applied after any gaps are bridged and extension days added to the length of the exposure episode.
Member-Years - sum of all days of enrollment with medical and drug coverage in the query period preceded by an exposure washout period all divided by 365.25.
Minimum Days Supplied - specifies a minimum number of days in length of the days supplied for the episode to be considered.
Minimum Episode Duration - specifies a minimum number of days in length of the episode for it to be considered. Applied after any gaps are bridged and extension days added to the length of the exposure episode.
Monitoring Period - used to define time periods of interest for both sequential analysis and simple cohort characterization requests.
Principal Diagnosis (PDX) - diagnosis or condition established to be chiefly responsible for admission of the patient to the hospital. 'P' = principal diagnosis, 'S' = secondary diagnosis, 'X' = unspecified diagnosis, '.' = blank. Along with the Care Setting values, forms the Caresetting/PDX parameter.
Query Period - period in which the modular program looks for exposures and outcomes of interest.

Glossary of Terms for Analyses Using
Cohort Identification and Descriptive Analysis (CIDA) Tool*

Treatment Episode Truncation Indicator - indicates whether the exposure episode will be truncated at the occurrence of a requester-specified code.

Washout Period (drug/exposure) - number of days a user is required to have no evidence of prior exposure (drug dispensing/procedure) and continuous drug and medical coverage prior to an incident treatment episode.

Washout Period (event/outcome) - number of days a user is required to have no evidence of a prior event (procedure/diagnosis) and continuous drug and medical coverage prior to an incident treatment episode.

Years at Risk - number of days supplied plus any episode gaps and exposure extension periods all divided by 365.25.

*all terms may not be used in this report

Table 1a. Baseline Table for Apixaban, Rivaroxaban, and Dabigatran, by Dose Strength

	All Study NOACs		Apixaban, 2.5 mg		Apixaban, 5 mg		Dabigatran, 75 mg	
Characteristic	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Number of unique patients	128,954	100.0%	1,372	100.0%	13,183	100.0%	683	100.0%
Demographics	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Mean Age (Years)	54.1	8.9	54.8	8.5	55.9	7.9	56.6	7.6
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Age (Years)								
21-35	7,129	5.5%	63	4.6%	439	3.3%	14	2.0%
36-50	29,526	22.9%	280	20.4%	2,375	18.0%	113	16.5%
51-64	92,299	71.6%	1,029	75.0%	10,369	78.7%	556	81.4%
Sex								
Female	50,613	39.2%	731	53.3%	3,999	30.3%	211	30.9%
Male	78,326	60.7%	641	46.7%	9,184	69.7%	472	69.1%
Other	15	0.0%	0	0.0%	0	0.0%	0	0.0%
Year								
2010	596	0.5%	0	0.0%	0	0.0%	13	1.9%
2011	9,999	7.80%	0	0.0%	0	0.0%	162	23.7%
2012	18,088	14.0%	0	0.0%	0	0.0%	177	25.9%
2013	29,259	22.7%	40	2.9%	1,530	11.6%	118	17.3%
2014	38,672	30.0%	359	26.2%	4,571	34.7%	123	18.0%
2015	32,340	25.1%	973	70.9%	7,082	53.7%	90	13.2%
Recorded history of:	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Prior combined comorbidity score[1]	1.1	1.8	1.1	2.2	1.7	1.8	2.5	2.4
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Atrial fibrillation (AF)	54,096	41.9%	293	21.4%	10,506	79.7%	545	79.8%
AF with no pulmonary embolism (PE) or deep vein thrombosis (DVT)	52,700	40.9%	275	20.0%	10,314	78.2%	537	78.6%
PE or DVT with no AF	25,225	19.6%	109	7.9%	1,608	12.2%	30	4.4%
Neither AF nor PE nor DVT	49,633	38.5%	970	70.7%	1,069	8.1%	108	15.8%
Institutional stay	2,453	1.9%	53	3.9%	179	1.4%	12	1.8%
Hip surgery	8,098	6.3%	181	13.2%	38	0.3%	2	0.3%

Table 1a. Baseline Table for Apixaban, Rivaroxaban, and Dabigatran, by Dose Strength

	All Study NOACs		Apixaban, 2.5 mg		Apixaban, 5 mg		Dabigatran, 75 mg	
Knee surgery	14,912	11.6%	317	23.1%	63	0.5%	0	0.0%
Spinal surgery	942	0.7%	9	0.7%	65	0.5%	1	0.1%
Dialysis	162	0.1%	29	2.1%	50	0.4%	6	0.9%

Table 1a. Baseline Table for Apixaban, Rivaroxaban, and Dabigatran by Dose Strength

	Dabigatran, 150 mg		Rivaroxaban, 10 mg		Rivaroxaban, 15 mg		Rivaroxaban, 20 mg	
Characteristic	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Number of unique patients	21,260	100.0%	40,197	100.0%	21,238	100.0%	36,874	100.0%
Demographics	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Mean Age (Years)	55.8	7.7	54.6	8.4	50	10.5	54	9.1
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Age (Years)								
21-35	587	2.8%	1,827	4.5%	2,638	12.4%	2,174	5.9%
36-50	4,032	19.0%	8,560	21.3%	7,350	34.6%	8,624	23.4%
51-64	16,641	78.3%	29,810	74.2%	11,250	53.0%	26,076	70.7%
Sex								
Female	5,092	24.0%	21,732	54.1%	9,259	43.6%	11,873	32.2%
Male	16,164	76.0%	18,460	45.9%	11,978	56.4%	24,996	67.8%
Other	4	0.0%	5	0.0%	1	0.0%	5	0.0%
Year								
2010	583	2.7%	0	0.0%	0	0.0%	0	0.0%
2011	8,180	38.5%	1,596	4.0%	2	0.0%	65	0.2%
2012	5,663	26.6%	8,665	21.6%	340	1.6%	3,377	9.2%
2013	3,073	14.5%	11,286	28.1%	5,052	23.8%	9,422	25.6%
2014	2,273	10.7%	11,516	28.6%	8,733	41.1%	13,429	36.4%
2015	1,488	7.0%	7,134	17.7%	7,111	33.5%	10,581	28.7%
Recorded history of:	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Prior combined comorbidity score[1]	1.5	1.6	0.2	1.2	1.1	2.1	1.4	1.9
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Atrial fibrillation (AF)	19,000	89.4%	1,115	2.8%	1,467	6.9%	22,620	61.3%
AF with no pulmonary embolism (PE) or deep vein thrombosis (DVT)	18,795	88.4%	1,088	2.7%	945	4.4%	22,040	59.8%
PE or DVT with no AF	555	2.6%	1,028	2.6%	16,270	76.6%	9,203	25.0%
Neither AF nor PE nor DVT	1,705	8.0%	38,054	94.7%	3,501	16.5%	5,051	13.7%
Institutional stay	202	1.0%	1,172	2.9%	420	2.0%	551	1.5%

Table 1a. Baseline Table for Apixaban, Rivaroxaban, and Dabigatran by Dose Strength

	Dabigatran, 150 mg		Rivaroxaban, 10 mg		Rivaroxaban, 15 mg		Rivaroxaban, 20 mg	
Hip surgery	44	0.2%	7,655	19.0%	102	0.5%	130	0.4%
Knee surgery	63	0.3%	14,075	35.0%	226	1.1%	267	0.7%
Spinal surgery	44	0.2%	462	1.1%	235	1.1%	203	0.6%
Dialysis	13	0.1%	11	0.0%	29	0.1%	31	0.1%

Table 1a. Baseline Table for Apixaban, Rivaroxaban, and Dabigatran by Dose Strength

	All Study NOACs		Apixaban, 2.5 mg		Apixaban, 5 mg		Dabigatran, 75 mg	
Characteristic	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Joint replacement	25,093	19.5%	530	38.6%	284	2.2%	11	1.6%
Kidney transplant	174	0.1%	9	0.7%	40	0.3%	7	1.0%
Mitral stenosis	708	0.5%	7	0.5%	111	0.8%	8	1.2%
Valve repair	96	0.1%	0	0.0%	17	0.1%	2	0.3%
Valve replacement	640	0.5%	7	0.5%	108	0.8%	9	1.3%
Prior bleeding event (AV, OA)	10,862	8.4%	157	11.4%	1,142	8.7%	79	11.6%
Prior bleeding event (ED, AV, OA)	11,352	8.8%	164	12.0%	1,193	9.0%	83	12.2%
Health Service Utilization Intensity:	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Mean number of ambulatory encounters (AV)	10	9.1	12.4	12.2	9.7	9.2	10.2	9.6
Mean number of emergency room encounters (ED)	0.5	1	0.4	1	0.6	1.2	0.8	1.2
Mean number of inpatient hospital encounters (IP)	0.5	0.7	0.6	0.8	0.4	0.7	0.6	0.7
Mean number of filled prescriptions	17.3	14.9	21.7	18.1	18.8	15.3	22.4	17.5
Mean number of generics	7.9	4.8	9.7	5.4	8.3	4.9	9.8	5.4
Mean number of unique drug classes	7.3	4.3	8.8	4.8	7.8	4.3	9.1	4.7

Table 1a. Baseline Table for Apixaban, Rivaroxaban, and Dabigatran by Dose Strength

	Dabigatran, 150 mg		Rivaroxaban, 10 mg		Rivaroxaban, 15 mg		Rivaroxaban, 20 mg	
Characteristic	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Joint replacement	364	1.7%	22,646	56.3%	621	2.9%	923	2.5%
Kidney transplant	29	0.1%	24	0.1%	41	0.2%	36	0.1%
Mitral stenosis	206	1.0%	57	0.1%	57	0.3%	282	0.8%
Valve repair	29	0.1%	4	0.0%	5	0.0%	39	0.1%
Valve replacement	186	0.9%	57	0.1%	45	0.2%	241	0.7%
Prior bleeding event (AV, OA)	1,524	7.2%	3,240	8.1%	2,040	9.6%	3,204	8.7%
Prior bleeding event (ED, AV, OA)	1,581	7.4%	3,298	8.2%	2,212	10.4%	3,394	9.2%
Health Service Utilization Intensity	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Mean number of ambulatory encounters (AV)	8.4	7.7	10.9	8.3	10.6	10.6	9.6	9.5
Mean number of emergency room encounters (ED)	0.5	0.9	0.3	0.7	0.9	1.3	0.7	1.2
Mean number of inpatient hospital encounters (IP)	0.4	0.6	0.6	0.6	0.6	0.8	0.4	0.7
Mean number of filled prescriptions	16.9	13.9	18	14.9	15.9	15.3	16.9	14.8
Mean number of generics	7.6	4.5	8.2	4.6	7.6	5.3	7.7	4.9
Mean number of unique drug classes	7.1	4	7.3	4.1	7	4.7	7.2	4.4

[1]Gagne JJ, Glynn RJ, Avorn J, Levin R, Schneeweiss S. A Combined Comorbidity Score Predicted Mortality in Elderly Patients Better Than Existing Scores. J Clin Epidemiol. 2011;64(7):749-759

Sun JW, Rogers JR, Her Q, Welch EC, Panozzo CA, Toh S, Gagne JJ. Adaptation and Validation of the Combined Comorbidity Score for ICD-10-CM. Med Care. 2017;55(12):1046-1051

Table 1b. Baseline Table for Apixaban, 2.5 mg Sensitivity Analyses

	Atrial Fibrillation (AF) Inclusion		AF Inclusion and Pulmonary Embolism (PE)/Deep Vein Thrombosis (DVT) Exclusion		PE/DVT Inclusion and AF Exclusion		AF/PE/DVT Exclusion		Surgery Inclusion	
Characteristic	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Number of unique patients	293	100.0%	275	100.0%	110	100.0%	971	100.0%	499	100.0%
Demographics	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Mean Age (Years)	58.4	6.3	58.4	6.4	51.4	10.4	54.1	8.4	56.5	6.4
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Age (Years)										
21-35	3	1.0%	3	1.1%	12	10.9%	48	4.9%	8	1.6%
36-50	27	9.2%	25	9.1%	30	27.3%	223	23.0%	81	16.2%
51-64	263	89.8%	247	89.8%	68	61.8%	700	72.1%	410	82.2%
Sex										
Female	93	31.7%	86	31.3%	49	44.5%	589	60.7%	269	53.9%
Male	200	68.3%	189	68.7%	61	55.5%	382	39.3%	230	46.1%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Year										
2010	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2011	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2012	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2013	31	10.6%	30	10.9%	3	2.7%	6	0.6%	0	0.0%
2014	90	30.7%	84	30.5%	20	18.2%	249	25.6%	132	26.5%
2015	172	58.7%	161	58.5%	87	79.1%	716	73.7%	367	73.5%
Recorded history of:	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Prior combined comorbidity score[1]	3.3	2.4	3.2	2.4	1.3	2.3	0.4	1.5	0.3	1.3
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Atrial fibrillation (AF)	293	100.0%	275	100.0%	0	0.0%	0	0.0%	18	3.6%
AF with no pulmonary embolism (PE) or deep vein thrombosis (DVT)	275	93.9%	275	100.00%	0	0.0%	0	0.0%	16	3.2%
PE or DVT with no AF	0	0.0%	0	0.0%	110	100.0%	0	0.0%	11	2.2%
Neither AF nor PE nor DVT	0	0.0%	0	0.0%	0	0.0%	971	100.0%	470	94.2%
Institutional stay	8	2.7%	6	2.2%	3	2.7%	42	4.3%	36	7.2%
Hip surgery	6	2.0%	6	2.2%	3	2.7%	172	17.7%	181	36.3%
Knee surgery	11	3.8%	9	3.3%	8	7.3%	298	30.7%	318	63.7%
Spinal surgery	1	0.3%	1	0.4%	0	0.0%	8	0.8%	9	1.8%
Dialysis	22	7.5%	21	7.6%	0	0.0%	7	0.7%	2	0.4%
Joint replacement	24	8.2%	22	8.0%	17	15.5%	489	50.4%	483	96.8%
Kidney transplant	5	1.7%	5	1.8%	0	0.0%	4	0.4%	2	0.4%
Mitral stenosis	6	2.0%	6	2.2%	0	0.0%	1	0.1%	0	0.0%
Valve repair	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Valve replacement	6	2.0%	6	2.2%	0	0.0%	1	0.1%	0	0.0%
Prior bleeding event (AV, OA)	59	20.1%	55	20.0%	17	15.5%	81	8.3%	37	7.4%
Prior bleeding event (ED, AV, OA)	61	20.8%	57	20.7%	18	16.4%	85	8.8%	39	7.8%
Health Service Utilization Intensity:	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Mean number of ambulatory encounters (AV)	14.4	19.1	14.2	19.1	13.1	9.8	11.6	9.4	12.2	10.9

Table 1b. Baseline Table for Apixaban, 2.5 mg Sensitivity Analyses

	Atrial Fibrillation (AF) Inclusion		AF Inclusion and Pulmonary Embolism (PE)/Deep Vein Thrombosis (DVT) Exclusion		PE/DVT Inclusion and AF Exclusion		AF/PE/DVT Exclusion		Surgery Inclusion	
Mean number of emergency room encounters (ED)	0.7	1	0.8	1	0.6	0.8	0.3	1	0.2	0.9
Mean number of inpatient hospital encounters (IP)	0.7	0.8	0.7	0.8	0.6	0.8	0.6	0.8	1.1	0.9
Mean number of filled prescriptions	26.6	19.2	26.4	19.2	20.3	23.1	20.3	16.9	21.2	15.9
Mean number of generics	11.2	5.7	11.1	5.6	8.9	6.3	9.3	5.1	9.5	5
Mean number of unique drug classes	10.4	5	10.4	5	8	5.4	8.5	4.5	8.5	4.3

[1]Gagne JJ, Glynn RJ, Avorn J, Levin R, Schneeweiss S. A Combined Comorbidity Score Predicted Mortality in Elderly Patients Better Than Existing Scores. J Clin Epidemiol. 2011;64(7):749-759

Sun JW, Rogers JR, Her Q, Welch EC, Panozzo CA, Toh S, Gagne JJ. Adaptation and Validation of the Combined Comorbidity Score for ICD-10-CM. Med Care. 2017;55(12):1046-1051

Table 1c. Baseline Table for Rivaroxaban, 10 mg Sensitivity Analyses

	AF Inclusion		AF Inclusion and PE/DVT Exclusion		PE/DVT Inclusion and AF Exclusion		AF/PE/DVT Exclusion		Surgery Inclusion	
Characteristic	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Number of unique patients	1,131		1,105	100.0%	1,036	100.0%	38,096	100.0%	21,662	100.0%
Demographics	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Mean Age (Years)	57.2	6.6	57.2	6.5	51.6	9.8	54.6	8.4	56.3	6.4
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Age (Years)										
21-35	18	1.6%	17	1.5%	105	10.1%	1,706	4.5%	275	1.3%
36-50	154	13.6%	151	13.7%	308	29.7%	8,115	21.3%	3,702	17.1%
51-64	959	84.8%	937	84.8%	623	60.1%	28,275	74.2%	17,685	81.6%
Sex										
Female	367	32.4%	357	32.3%	563	54.3%	20,839	54.7%	11,305	52.2%
Male	764	67.6%	748	67.7%	473	45.7%	17,252	45.3%	10,353	47.8%
Other	0	0.0%	0	0.0%	0	0.0%	5	0.0%	4	0.0%
Year										
2010	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2011	37	3.3%	36	3.3%	29	2.8%	1,530	4.0%	1,004	4.6%
2012	241	21.3%	237	21.4%	156	15.1%	8,270	21.7%	5,011	23.1%
2013	285	25.2%	279	25.2%	288	27.8%	10,726	28.2%	6,119	28.2%
2014	377	33.3%	370	33.5%	349	33.7%	10,820	28.4%	5,974	27.6%
2015	191	16.9%	183	16.6%	214	20.7%	6,750	17.7%	3,554	16.4%
Recorded history of:	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Prior combined comorbidity score[1]	1.8	1.8	1.8	1.8	0.7	1.8	0.2	1.1	0.2	1.2
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Atrial fibrillation (AF)	1,131	100.0%	1,105	100.0%	0	0.0%	0	0.0%	446	2.1%
AF with no pulmonary embolism (PE) or deep vein thrombosis (DVT)	1,104	97.6%	1,105	100.0%	0	0.0%	0	0.0%	442	2.0%
PE or DVT with no AF	0	0.0%	0	0.0%	1,036	100.0%	0	0.0%	315	1.5%
Neither AF nor PE nor DVT	0	0.0%	0	0.0%	0	0.0%	38,096	100.0%	20,901	96.5%
Institutional stay	49	4.3%	47	4.3%	46	4.4%	1,079	2.8%	922	4.3%
Hip surgery	156	13.8%	157	14.2%	87	8.4%	7,420	19.5%	7,685	35.5%
Knee surgery	298	26.3%	294	26.6%	217	20.9%	13,574	35.6%	14,163	65.4%
Spinal surgery	16	1.4%	16	1.4%	20	1.9%	426	1.1%	462	2.1%
Dialysis	4	0.4%	4	0.4%	1	0.1%	6	0.0%	0	0.0%
Joint replacement	475	42.0%	470	42.5%	335	32.3%	21,868	57.4%	21,261	98.1%
Kidney transplant	3	0.3%	3	0.3%	0	0.0%	21	0.1%	12	0.1%
Mitral stenosis	6	0.5%	6	0.5%	3	0.3%	48	0.1%	30	0.1%
Valve repair	2	0.2%	2	0.2%	0	0.0%	2	0.0%	1	0.0%
Valve replacement	12	1.1%	12	1.1%	2	0.2%	43	0.1%	33	0.2%
Prior bleeding event (AV, OA)	103	9.1%	100	9.0%	127	12.3%	3,013	7.9%	1,686	7.8%
Prior bleeding event (ED, AV, OA)	104	9.2%	101	9.1%	129	12.5%	3,069	8.1%	1,711	7.9%

Table 1c. Baseline Table for Rivaroxaban, 10 mg Sensitivity Analyses

	AF Inclusion		AF Inclusion and PE/DVT Exclusion		PE/DVT Inclusion and AF Exclusion		AF/PE/DVT Exclusion		Surgery Inclusion	
Health Service Utilization Intensity:	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Mean number of ambulatory encounters (AV)	11.9	9.4	11.8	9.3	13	10.5	10.8	8.2	11.3	8
Mean number of emergency room encounters (ED)	0.5	1.1	0.5	1.1	0.5	1.1	0.2	0.7	0.2	0.6
inpatient hospital encounters (IP)	0.7	0.7	0.8	0.7	0.5	0.7	0.6	0.5	1	0.3
Mean number of filled prescriptions	21.5	17	21.5	17.1	18.3	16.7	17.9	14.8	19.4	15.1
Mean number of generics	9.3	5.1	9.3	5.1	8.5	5.6	8.1	4.6	8.6	4.6
Mean number of unique drug classes	8.5	4.4	8.5	4.4	7.7	4.9	7.3	4	7.6	4

[1]Gagne JJ, Glynn RJ, Avorn J, Levin R, Schneeweiss S. A Combined Comorbidity Score Predicted Mortality in Elderly Patients Better Than Existing Scores. J Clin Epidemiol. 2011;64(7):749-759

Sun JW, Rogers JR, Her Q, Welch EC, Panozzo CA, Toh S, Gagne JJ. Adaptation and Validation of the Combined Comorbidity Score for ICD-10-CM. Med Care. 2017;55(12):1046-1051

Table 2. Summary of use of Apixaban, Dabigatran, and Rivaroxaban in Those Aged 21 to 64 Years in the Sentinel Distributed Database (SDD) between October 19, 2010 and September 30, 2015

Level	New Users	Eligible Members[1]	Adjusted Dispensings	Raw Dispensings	Days Supplied	Amount Supplied	Dispensings / User	Days Supplied / User	Days Supplied / Dispensing
Outcome: Ischemic Stroke									
NOAC: Apixaban, Dabigatran, or Rivaroxaban (any dose), 3-day gap									
	128,954	59,080,439	311,098	315,385	9,439,987	13,250,333	2.4	73.2	30.3
Apixaban, 2.5 mg, 3-day gap									
	1,372	59,080,439	1,845	1,845	41,401	83,565	1.3	30.2	22.4
Apixaban, 5 mg, 3-day gap									
	13,183	59,080,439	34,438	34,439	1,083,082	2,162,532	2.6	82.2	31.5
Dabigatran, 75 mg, 3-day gap									
	683	59,080,440	1,484	1,486	48,933	102,917	2.2	71.6	33.0
Dabigatran, 150 mg, 3-day gap									
	21,260	59,080,440	60,403	60,414	2,131,302	4,255,478	2.8	100.2	35.3
Rivaroxaban, 10 mg, 3-day gap									
	40,197	59,080,442	42,340	42,340	729,049	742,187	1.1	18.1	17.2
Rivaroxaban, 15 mg, 3-day gap									
	21,238	59,080,458	25,404	25,411	427,584	706,039	1.2	20.1	16.8
Rivaroxaban, 20 mg, 3-day gap									
	36,874	59,080,462	100,102	100,126	3,124,288	3,126,199	2.7	84.7	31.2
NOAC: Apixaban, Dabigatran, or Rivaroxaban (any dose), 14-day gap									
	128,954	59,080,439	428,754	433,089	13,221,147	18,775,948	3.3	102.5	30.8
Apixaban, 2.5 mg, 14-day gap									
	1,372	59,080,439	2,144	2,144	50,422	102,045	1.6	36.8	23.5
Apixaban, 5 mg, 14-day gap									
	13,183	59,080,439	47,892	47,893	1,499,055	2,993,050	3.6	113.7	31.3
Dabigatran, 75 mg, 14-day gap									
	683	59,080,440	2,046	2,048	68,258	143,755	3.0	99.9	33.4
Dabigatran, 150 mg, 14-day gap									
	21,260	59,080,440	96,187	96,200	3,332,764	6,656,501	4.5	156.8	34.6
Rivaroxaban, 10 mg, 14-day gap									
	40,197	59,080,442	43,348	43,348	754,410	771,687	1.1	18.8	17.4

Table 2. Summary of use of Apixaban, Dabigatran, and Rivaroxaban in Those Aged 21 to 64 Years in the Sentinel Distributed Database (SDD) between October 19, 2010 and September 30, 2015

Level	New Users	Eligible Members[1]	Adjusted Dispensings	Raw Dispensings	Days Supplied	Amount Supplied	Dispensings / User	Days Supplied / User	Days Supplied / Dispensing
Outcome: Ischemic Stroke									
Rivaroxaban, 15 mg, 14-day gap									
	21,238	59,080,458	27,499	27,506	489,301	778,402	1.3	23.0	17.8
Rivaroxaban, 20 mg, 14-day gap									
	36,874	59,080,462	142,286	142,314	4,465,746	4,468,236	3.9	121.1	31.4

[1]Eligible Members are reflective of the number of patients that met all cohort entry criteria on at least one day during the query period

Table 3. Summary of use of Apixaban, Dabigatran, and Rivaroxaban in Those Aged 21 to 64 in the Sentinel Distributed Database (SDD) between October 19, 2010 and September 30, 2015 by Age Group

Age Group (Years)	New Users	Eligible Members[1]	Adjusted Dispensings	Raw Dispensings	Days Supplied	Amount Supplied	Dispensings / User	Days Supplied / User	Days Supplied / Dispensing
NOAC: Apixaban, Dabigatran, or Rivaroxaban (any dose), 3-day gap									
21-35	7,129	23,597,784	14,790	15,379	399,982	511,700	2.1	56.1	27.0
36-50	29,526	22,488,999	66,191	67,698	1,899,357	2,528,558	2.2	64.3	28.7
51-64	92,299	18,591,964	230,117	232,308	7,140,648	10,210,075	2.5	77.4	31.0
Apixaban, 2.5 mg, 3-day gap									
21-35	63	23,597,784	70	70	1,099	2,503	1.1	17.4	15.7
36-50	280	22,489,580	357	357	7,050	14,178	1.3	25.2	19.7
51-64	1,029	18,595,206	1,418	1,418	33,252	66,884	1.4	32.3	23.4
Apixaban, 5 mg, 3-day gap									
21-35	439	23,597,784	863	864	22,936	46,188	2.0	52.2	26.6
36-50	2,375	22,489,564	5,307	5,307	154,650	308,852	2.2	65.1	29.1
51-64	10,369	18,595,153	28,268	28,268	905,496	1,807,492	2.7	87.3	32.0
Dabigatran, 75 mg, 3-day gap									
21-35	14	23,597,784	15	16	452	1,103	1.1	32.3	30.1
36-50	113	22,489,581	184	184	5,167	10,891	1.6	45.7	28.1
51-64	556	18,595,207	1,285	1,286	43,314	90,923	2.3	77.9	33.7
Dabigatran, 150 mg, 3-day gap									
21-35	587	23,597,784	1,022	1,022	32,339	64,040	1.7	55.1	31.6
36-50	4,032	22,489,473	9,051	9,051	303,943	606,858	2.2	75.4	33.6
51-64	16,641	18,594,495	50,330	50,341	1,795,020	3,584,581	3.0	107.9	35.7
Rivaroxaban, 10 mg, 3-day gap									
21-35	1,827	23,597,784	1,982	1,982	35,169	35,789	1.1	19.2	17.7
36-50	8,560	22,489,363	9,059	9,059	158,218	161,717	1.1	18.5	17.5
51-64	29,810	18,593,623	31,299	31,299	535,662	544,681	1.0	18.0	17.1
Rivaroxaban, 15 mg, 3-day gap									
21-35	2,638	23,597,784	2,901	2,903	42,655	78,054	1.1	16.2	14.7
36-50	7,350	22,489,464	8,338	8,339	128,897	227,540	1.1	17.5	15.5
51-64	11,250	18,594,880	14,165	14,169	256,032	400,445	1.3	22.8	18.1
Rivaroxaban, 20 mg, 3-day gap									
21-35	2,174	23,597,784	3,601	3,601	86,873	86,874	1.7	40.0	24.1
36-50	8,624	22,489,468	19,232	19,237	552,008	552,476	2.2	64.0	28.7
51-64	26,076	18,594,658	77,269	77,288	2,485,407	2,486,849	3.0	95.3	32.2
NOAC: Apixaban, Dabigatran, or Rivaroxaban (any dose), 14-day gap									
21-35	7,129	23,597,784	18,184	18,775	498,504	626,377	2.6	69.9	27.4
36-50	29,526	22,488,999	87,926	89,448	2,569,829	3,435,218	3.0	87.0	29.2
51-64	92,299	18,591,964	322,644	324,866	10,152,814	14,714,353	3.5	110.0	31.5
Apixaban, 2.5 mg, 14-day gap									
21-35	63	23,597,784	73	73	1,171	2,647	1.2	18.6	16.0
36-50	280	22,489,580	402	402	8,489	17,104	1.4	30.3	21.1
51-64	1,029	18,595,206	1,669	1,669	40,762	82,294	1.6	39.6	24.4
Apixaban, 5 mg, 14-day gap									
21-35	439	23,597,784	1,050	1,051	28,238	56,785	2.4	64.3	26.9

Table 3. Summary of use of Apixaban, Dabigatran, and Rivaroxaban in Those Aged 21 to 64 in the Sentinel Distributed Database (SDD) between October 19, 2010 and September 30, 2015 by Age Group

Age Group (Years)	New Users	Eligible Members[1]	Adjusted Dispensings	Raw Dispensings	Days Supplied	Amount Supplied	Dispensings / User	Days Supplied / User	Days Supplied / Dispensing
36-50	2,375	22,489,564	7,136	7,136	210,014	419,281	3.0	88.4	29.4
51-64	10,369	18,595,153	39,706	39,706	1,260,803	2,516,984	3.8	121.6	31.8
Dabigatran, 75 mg, 14-day gap									
21-35	14	23,597,784	18	19	542	1,283	1.3	38.7	30.1
36-50	113	22,489,581	275	275	7,895	16,527	2.4	69.9	28.7
51-64	556	18,595,207	1,753	1,754	59,821	125,945	3.2	107.6	34.1
Dabigatran, 150 mg, 14-day gap									
21-35	587	23,597,784	1,277	1,277	39,911	79,304	2.2	68.0	31.3
36-50	4,032	22,489,473	14,006	14,006	460,914	920,584	3.5	114.3	32.9
51-64	16,641	18,594,495	80,904	80,917	2,831,939	5,656,614	4.9	170.2	35.0
Rivaroxaban, 10 mg, 14-day gap									
21-35	1,827	23,597,784	2,061	2,061	36,938	37,552	1.1	20.2	17.9
36-50	8,560	22,489,363	9,273	9,273	163,397	167,764	1.1	19.1	17.6
51-64	29,810	18,593,623	32,014	32,014	554,075	566,371	1.1	18.6	17.3
Rivaroxaban, 15 mg, 14-day gap									
21-35	2,638	23,597,784	2,986	2,988	44,946	81,095	1.1	17.0	15.1
36-50	7,350	22,489,464	8,826	8,827	142,481	245,106	1.2	19.4	16.1
51-64	11,250	18,594,880	15,687	15,691	301,874	452,201	1.4	26.8	19.2
Rivaroxaban, 20 mg, 14-day gap									
21-35	2,174	23,597,784	4,650	4,650	118,310	118,311	2.1	54.4	25.4
36-50	8,624	22,489,468	26,704	26,709	782,534	783,146	3.1	90.7	29.3
51-64	26,076	18,594,658	110,932	110,955	3,564,902	3,566,779	4.3	136.7	32.1

[1]Eligible Members are reflective of the number of patients that met all cohort entry criteria on at least one day during the query period

Appendix A. Dates of Available Data for Each Data Partner (DP) up to Request End Date (9/30/2015) As of Query Distribution Date

Data Partner ID	Start Date[1]	End Date[1]
DP01	01/01/2000	09/30/2015
DP02	01/01/2000	09/30/2015
DP03	01/01/2004	09/30/2015
DP04	01/01/2008	09/30/2015
DP05	06/01/2007	09/30/2015
DP06	01/01/2000	09/30/2015
DP07	01/01/2006	09/30/2015
DP08	01/01/2000	09/30/2015
DP09	01/01/2000	09/30/2015
DP10	01/01/2000	09/30/2015
DP11	01/01/2005	09/30/2015
DP12	01/01/2000	09/30/2015
DP13	01/01/2000	09/30/2015
DP14	01/01/2008	09/30/2015
DP15	01/01/2000	05/31/2015
DP16	01/01/2012	09/30/2015

[1]The start and end dates are based on the minimum and maximum dates within each DP. The month with the maximum data must have at least 80% of the number of records in the previous month.

Appendix B. List of Generic and Brand Names of Medical Products Used to Define Exposures in this Request

Generic Name	Brand Name
apixaban	Eliquis
dabigatran etexilate mesylate	Pradaxa
rivaroxaban	Xarelto
warfarin sodium	Warfarin
warfarin sodium	Jantoven
warfarin sodium	Coumadin
warfarin sodium	Warfarin (bulk)

Appendix C. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Diagnosis Codes Used to Define Cohort Inclusion Criteria

Code	Description	Code Category	Code Type
Ischemic Stroke			
433.01	Occlusion and stenosis of basilar artery with cerebral infarction	Diagnosis	ICD-9-CM
433.11	Occlusion and stenosis of carotid artery with cerebral infarction	Diagnosis	ICD-9-CM
433.21	Occlusion and stenosis of vertebral artery with cerebral infarction	Diagnosis	ICD-9-CM
433.31	Occlusion and stenosis of multiple and bilateral precerebral arteries with cerebral	Diagnosis	ICD-9-CM
433.81	Occlusion and stenosis of other specified precerebral artery with cerebral infarction	Diagnosis	ICD-9-CM
433.91	Occlusion and stenosis of unspecified precerebral artery with cerebral infarction	Diagnosis	ICD-9-CM
434.01	Cerebral thrombosis with cerebral infarction	Diagnosis	ICD-9-CM
434.11	Cerebral embolism with cerebral infarction	Diagnosis	ICD-9-CM
434.91	Unspecified cerebral artery occlusion with cerebral infarction	Diagnosis	ICD-9-CM
436	Acute, but ill-defined, cerebrovascular disease	Diagnosis	ICD-9-CM
Intracranial Hemorrhage			
430	Subarachnoid hemorrhage	Diagnosis	ICD-9-CM
431	Intracerebral hemorrhage	Diagnosis	ICD-9-CM
432	Other and unspecified intracranial hemorrhage	Diagnosis	ICD-9-CM
432.0	Nontraumatic extradural hemorrhage	Diagnosis	ICD-9-CM
432.1	Subdural hemorrhage	Diagnosis	ICD-9-CM
432.9	Unspecified intracranial hemorrhage	Diagnosis	ICD-9-CM
852.0	Subarachnoid hemorrhage following injury without mention of open intracranial	Diagnosis	ICD-9-CM
852.00	Subarachnoid hemorrhage following injury, without mention of open intracranial wound, unspecified state of consciousness	Diagnosis	ICD-9-CM
852.01	Subarachnoid hemorrhage following injury, without mention of open intracranial wound, no loss of consciousness	Diagnosis	ICD-9-CM
852.02	Subarachnoid hemorrhage following injury, without mention of open intracranial wound, brief (less than 1 hour) loss of consciousness	Diagnosis	ICD-9-CM
852.03	Subarachnoid hemorrhage following injury, without mention of open intracranial wound, moderate (1-24 hours) loss of consciousness	Diagnosis	ICD-9-CM
852.04	Subarachnoid hemorrhage following injury, without mention of open intracranial wound, prolonged (more than 24 hours) loss of consciousness and return to pre-	Diagnosis	ICD-9-CM
852.05	Subarachnoid hemorrhage following injury, without mention of open intracranial wound, prolonged (more than 24 hours) loss of consciousness, without return to pre-	Diagnosis	ICD-9-CM
852.06	Subarachnoid hemorrhage following injury, without mention of open intracranial wound, loss of consciousness of unspecified duration	Diagnosis	ICD-9-CM
852.09	Subarachnoid hemorrhage following injury, without mention of open intracranial wound, unspecified concussion	Diagnosis	ICD-9-CM
852.2	Subdural hemorrhage following injury without mention of open intracranial wound	Diagnosis	ICD-9-CM
852.20	Subdural hemorrhage following injury, without mention of open intracranial wound, unspecified state of consciousness	Diagnosis	ICD-9-CM
852.21	Subdural hemorrhage following injury, without mention of open intracranial wound, no loss of consciousness	Diagnosis	ICD-9-CM
852.22	Subdural hemorrhage following injury, without mention of open intracranial wound, brief (less than one hour) loss of consciousness	Diagnosis	ICD-9-CM
852.23	Subdural hemorrhage following injury, without mention of open intracranial wound, moderate (1-24 hours) loss of consciousness	Diagnosis	ICD-9-CM
852.24	Subdural hemorrhage following injury, without mention of open intracranial wound, prolonged (more than 24 hours) loss of consciousness and return to pre-existing	Diagnosis	ICD-9-CM

Appendix C. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Diagnosis Codes Used to Define Cohort Inclusion Criteria

Code	Description	Code Category	Code Type
852.25	Subdural hemorrhage following injury, without mention of open intracranial wound, prolonged (more than 24 hours) loss of consciousness, without return to pre-existing	Diagnosis	ICD-9-CM
852.26	Subdural hemorrhage following injury, without mention of open intracranial wound, loss of consciousness of unspecified duration	Diagnosis	ICD-9-CM
852.29	Subdural hemorrhage following injury, without mention of open intracranial wound, unspecified concussion	Diagnosis	ICD-9-CM
852.4	Extradural hemorrhage following injury without mention of open intracranial wound	Diagnosis	ICD-9-CM
852.40	Extradural hemorrhage following injury, without mention of open intracranial wound, unspecified state of consciousness	Diagnosis	ICD-9-CM
852.41	Extradural hemorrhage following injury, without mention of open intracranial wound, no loss of consciousness	Diagnosis	ICD-9-CM
852.42	Extradural hemorrhage following injury, without mention of open intracranial wound, brief (less than 1 hour) loss of consciousness	Diagnosis	ICD-9-CM
852.43	Extradural hemorrhage following injury, without mention of open intracranial wound, moderate (1-24 hours) loss of consciousness	Diagnosis	ICD-9-CM
852.44	Extradural hemorrhage following injury, without mention of open intracranial wound, prolonged (more than 24 hours) loss of consciousness and return to pre-existing	Diagnosis	ICD-9-CM
852.45	Extradural hemorrhage following injury, without mention of open intracranial wound, prolonged (more than 24 hours) loss of consciousness, without return to pre-existing	Diagnosis	ICD-9-CM
852.46	Extradural hemorrhage following injury, without mention of open intracranial wound, loss of consciousness of unspecified duration	Diagnosis	ICD-9-CM
852.49	Extradural hemorrhage following injury, without mention of open intracranial wound, unspecified concussion	Diagnosis	ICD-9-CM
853.0	Other and unspecified intracranial hemorrhage following injury, without mention of open intracranial wound	Diagnosis	ICD-9-CM
853.00	Other and unspecified intracranial hemorrhage following injury, without mention of open intracranial wound, unspecified state of consciousness	Diagnosis	ICD-9-CM
853.01	Other and unspecified intracranial hemorrhage following injury, without mention of open intracranial wound, no loss of consciousness	Diagnosis	ICD-9-CM
853.02	Other and unspecified intracranial hemorrhage following injury, without mention of open intracranial wound, brief (less than 1 hour) loss of consciousness	Diagnosis	ICD-9-CM
853.03	Other and unspecified intracranial hemorrhage following injury, without mention of open intracranial wound, moderate (1-24 hours) loss of consciousness	Diagnosis	ICD-9-CM
853.04	Other and unspecified intracranial hemorrhage following injury, without mention of open intracranial wound, prolonged (more than 24 hours) loss of consciousness and return to preexisting conscious level	Diagnosis	ICD-9-CM
853.05	Other and unspecified intracranial hemorrhage following injury. Without mention of open intracranial wound, prolonged (more than 24 hours) loss of consciousness, without return to pre-existing conscious level	Diagnosis	ICD-9-CM
853.06	Other and unspecified intracranial hemorrhage following injury, without mention of open intracranial wound, loss of consciousness of unspecified duration	Diagnosis	ICD-9-CM
853.09	Other and unspecified intracranial hemorrhage following injury, without mention of open intracranial wound, unspecified concussion	Diagnosis	ICD-9-CM

Appendix C. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Diagnosis Codes Used to Define Cohort Inclusion Criteria

Code	Description	Code Category	Code Type
Gastrointestinal Bleeding - List 1			
455.2	Internal hemorrhoids with other complication	Diagnosis	ICD-9-CM
455.5	External hemorrhoids with other complication	Diagnosis	ICD-9-CM
455.8	Unspecified hemorrhoids with other complication	Diagnosis	ICD-9-CM
456.0	Esophageal varices with bleeding	Diagnosis	ICD-9-CM
456.20	Esophageal varices with bleeding in diseases classified elsewhere	Diagnosis	ICD-9-CM
459.0	Unspecified hemorrhage	Diagnosis	ICD-9-CM
530.7	Gastroesophageal laceration-hemorrhage syndrome	Diagnosis	ICD-9-CM
530.82	Esophageal hemorrhage	Diagnosis	ICD-9-CM
531.00	Acute gastric ulcer with hemorrhage, without mention of obstruction	Diagnosis	ICD-9-CM
531.01	Acute gastric ulcer with hemorrhage and obstruction	Diagnosis	ICD-9-CM
531.20	Acute gastric ulcer with hemorrhage and perforation, without mention of obstruction	Diagnosis	ICD-9-CM
531.21	Acute gastric ulcer with hemorrhage, perforation, and obstruction	Diagnosis	ICD-9-CM
531.40	Chronic or unspecified gastric ulcer with hemorrhage, without mention of obstruction	Diagnosis	ICD-9-CM
531.41	Chronic or unspecified gastric ulcer with hemorrhage and obstruction	Diagnosis	ICD-9-CM
531.60	Chronic or unspecified gastric ulcer with hemorrhage and perforation	Diagnosis	ICD-9-CM
531.61	Chronic or unspecified gastric ulcer with hemorrhage, perforation, and obstruction	Diagnosis	ICD-9-CM
532.00	Acute duodenal ulcer with hemorrhage, without mention of obstruction	Diagnosis	ICD-9-CM
532.01	Acute duodenal ulcer with hemorrhage and obstruction	Diagnosis	ICD-9-CM
532.20	Acute duodenal ulcer with hemorrhage and perforation, without mention of	Diagnosis	ICD-9-CM
532.21	Acute duodenal ulcer with hemorrhage, perforation, and obstruction	Diagnosis	ICD-9-CM
532.40	Duodenal ulcer, chronic or unspecified, with hemorrhage, without mention of	Diagnosis	ICD-9-CM
532.41	Chronic or unspecified duodenal ulcer with hemorrhage and obstruction	Diagnosis	ICD-9-CM
532.60	Chronic or unspecified duodenal ulcer with hemorrhage and perforation, without mention of obstruction	Diagnosis	ICD-9-CM
532.61	Chronic or unspecified duodenal ulcer with hemorrhage, perforation, and obstruction	Diagnosis	ICD-9-CM
533.00	Acute peptic ulcer, unspecified site, with hemorrhage, without mention of obstruction	Diagnosis	ICD-9-CM
533.01	Acute peptic ulcer, unspecified site, with hemorrhage and obstruction	Diagnosis	ICD-9-CM
533.20	Acute peptic ulcer, unspecified site, with hemorrhage and perforation, without mention of obstruction	Diagnosis	ICD-9-CM
533.21	Acute peptic ulcer, unspecified site, with hemorrhage, perforation, and obstruction	Diagnosis	ICD-9-CM
533.40	Chronic or unspecified peptic ulcer, unspecified site, with hemorrhage, without mention of obstruction	Diagnosis	ICD-9-CM
533.41	Chronic or unspecified peptic ulcer, unspecified site, with hemorrhage and	Diagnosis	ICD-9-CM
533.60	Chronic or unspecified peptic ulcer, unspecified site, with hemorrhage and perforation, without mention of obstruction	Diagnosis	ICD-9-CM
533.61	Chronic or unspecified peptic ulcer, unspecified site, with hemorrhage, perforation, and obstruction	Diagnosis	ICD-9-CM
534.00	Acute gastrojejunal ulcer with hemorrhage, without mention of obstruction	Diagnosis	ICD-9-CM
534.01	Acute gastrojejunal ulcer, with hemorrhage and obstruction	Diagnosis	ICD-9-CM
534.20	Acute gastrojejunal ulcer with hemorrhage and perforation, without mention of	Diagnosis	ICD-9-CM
534.21	Acute gastrojejunal ulcer with hemorrhage, perforation, and obstruction	Diagnosis	ICD-9-CM
534.40	Chronic or unspecified gastrojejunal ulcer with hemorrhage, without mention of	Diagnosis	ICD-9-CM
534.41	Chronic or unspecified gastrojejunal ulcer, with hemorrhage and obstruction	Diagnosis	ICD-9-CM

Appendix C. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Diagnosis Codes Used to Define Cohort Inclusion Criteria

Code	Description	Code Category	Code Type
534.60	Chronic or unspecified gastrojejunal ulcer with hemorrhage and perforation, without mention of obstruction	Diagnosis	ICD-9-CM
534.61	Chronic or unspecified gastrojejunal ulcer with hemorrhage, perforation, and	Diagnosis	ICD-9-CM
535.01	Acute gastritis with hemorrhage	Diagnosis	ICD-9-CM
535.11	Atrophic gastritis with hemorrhage	Diagnosis	ICD-9-CM
535.21	Gastric mucosal hypertrophy with hemorrhage	Diagnosis	ICD-9-CM
535.31	Alcoholic gastritis with hemorrhage	Diagnosis	ICD-9-CM
535.41	Other specified gastritis with hemorrhage	Diagnosis	ICD-9-CM
535.51	Unspecified gastritis and gastroduodenitis with hemorrhage	Diagnosis	ICD-9-CM
535.61	Duodenitis with hemorrhage	Diagnosis	ICD-9-CM
537.83	Angiodysplasia of stomach and duodenum with hemorrhage	Diagnosis	ICD-9-CM
562.02	Diverticulosis of small intestine with hemorrhage	Diagnosis	ICD-9-CM
562.03	Diverticulitis of small intestine with hemorrhage	Diagnosis	ICD-9-CM
562.12	Diverticulosis of colon with hemorrhage	Diagnosis	ICD-9-CM
562.13	Diverticulitis of colon with hemorrhage	Diagnosis	ICD-9-CM
568.81	Hemoperitoneum (nontraumatic)	Diagnosis	ICD-9-CM
569.3	Hemorrhage of rectum and anus	Diagnosis	ICD-9-CM
569.85	Angiodysplasia of intestine with hemorrhage	Diagnosis	ICD-9-CM
578.0	Hematemesis	Diagnosis	ICD-9-CM
578.1	Blood in stool	Diagnosis	ICD-9-CM
578.9	Hemorrhage of gastrointestinal tract, unspecified	Diagnosis	ICD-9-CM
Gastrointestinal Bleeding - List 2			
455.0	Internal hemorrhoids without mention of complication	Diagnosis	ICD-9-CM
455.1	Internal thrombosed hemorrhoids	Diagnosis	ICD-9-CM
455.3	External hemorrhoids without mention of complication	Diagnosis	ICD-9-CM
455.4	External thrombosed hemorrhoids	Diagnosis	ICD-9-CM
455.6	Unspecified hemorrhoids without mention of complication	Diagnosis	ICD-9-CM
455.7	Unspecified thrombosed hemorrhoids	Diagnosis	ICD-9-CM
531.1	Acute gastric ulcer with perforation	Diagnosis	ICD-9-CM
531.3	Acute gastric ulcer without mention of hemorrhage or perforation	Diagnosis	ICD-9-CM
531.5	Chronic or unspecified gastric ulcer with perforation	Diagnosis	ICD-9-CM
531.7	Chronic gastric ulcer without mention of hemorrhage or perforation	Diagnosis	ICD-9-CM
531.9	Gastric ulcer, unspecified as acute or chronic, without mention of hemorrhage or	Diagnosis	ICD-9-CM
532.1	Acute duodenal ulcer with perforation	Diagnosis	ICD-9-CM
532.3	Acute duodenal ulcer without mention of hemorrhage or perforation	Diagnosis	ICD-9-CM
532.5	Chronic or unspecified duodenal ulcer with perforation	Diagnosis	ICD-9-CM
532.7	Chronic duodenal ulcer without mention of hemorrhage or perforation	Diagnosis	ICD-9-CM
532.9	Duodenal ulcer, unspecified as acute or chronic, without mention of hemorrhage or	Diagnosis	ICD-9-CM
533.1	Acute peptic ulcer, unspecified site, with perforation	Diagnosis	ICD-9-CM
533.3	Acute peptic ulcer, unspecified site, without mention of hemorrhage and perforation	Diagnosis	ICD-9-CM
533.5	Chronic or unspecified peptic ulcer, unspecified site, with perforation	Diagnosis	ICD-9-CM
533.7	Chronic peptic ulcer, unspecified site, without mention of hemorrhage or perforation	Diagnosis	ICD-9-CM
533.9	Peptic ulcer, unspecified site, unspecified as acute or chronic, without mention of hemorrhage or perforation	Diagnosis	ICD-9-CM
534.1	Acute gastrojejunal ulcer with perforation	Diagnosis	ICD-9-CM
534.3	Acute gastrojejunal ulcer without mention of hemorrhage or perforation	Diagnosis	ICD-9-CM

Appendix C. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Diagnosis Codes Used to Define Cohort Inclusion Criteria

Code	Description	Code Category	Code Type
534.5	Chronic or unspecified gastrojejunal ulcer with perforation	Diagnosis	ICD-9-CM
534.7	Chronic gastrojejunal ulcer without mention of hemorrhage or perforation	Diagnosis	ICD-9-CM
534.9	Gastrojejunal ulcer, unspecified as acute or chronic, without mention of hemorrhage or perforation	Diagnosis	ICD-9-CM
535.00	Acute gastritis without mention of hemorrhage	Diagnosis	ICD-9-CM
535.10	Atrophic gastritis without mention of hemorrhage	Diagnosis	ICD-9-CM
535.20	Gastric mucosal hypertrophy without mention of hemorrhage	Diagnosis	ICD-9-CM
535.30	Alcoholic gastritis without mention of hemorrhage	Diagnosis	ICD-9-CM
535.40	Other specified gastritis without mention of hemorrhage	Diagnosis	ICD-9-CM
535.50	Unspecified gastritis and gastroduodenitis without mention of hemorrhage	Diagnosis	ICD-9-CM
535.60	Duodenitis without mention of hemorrhage	Diagnosis	ICD-9-CM
562.00	Diverticulosis of small intestine (without mention of hemorrhage)	Diagnosis	ICD-9-CM
562.01	Diverticulitis of small intestine (without mention of hemorrhage)	Diagnosis	ICD-9-CM
562.10	Diverticulosis of colon (without mention of hemorrhage)	Diagnosis	ICD-9-CM
562.11	Diverticulitis of colon (without mention of hemorrhage)	Diagnosis	ICD-9-CM
530.1	Esophagitis	Diagnosis	ICD-9-CM
Other Extracranial Bleeding			
280.0	Iron deficiency anemia secondary to blood loss (chronic)	Diagnosis	ICD-9-CM
285.1	Acute posthemorrhagic anemia	Diagnosis	ICD-9-CM
285.9	Unspecified anemia	Diagnosis	ICD-9-CM
423.0	Hemopericardium	Diagnosis	ICD-9-CM
593.81	Vascular disorders of kidney	Diagnosis	ICD-9-CM
599.7	Hematuria	Diagnosis	ICD-9-CM
623.8	Other specified noninflammatory disorder of vagina	Diagnosis	ICD-9-CM
626.2	Excessive or frequent menstruation	Diagnosis	ICD-9-CM
626.6	Metrorrhagia	Diagnosis	ICD-9-CM
719.10	Hemarthrosis, site unspecified	Diagnosis	ICD-9-CM
719.11	Hemarthrosis, shoulder region	Diagnosis	ICD-9-CM
719.12	Hemarthrosis, upper arm	Diagnosis	ICD-9-CM
719.13	Hemarthrosis, forearm	Diagnosis	ICD-9-CM
719.14	Hemarthrosis, hand	Diagnosis	ICD-9-CM
719.15	Hemarthrosis, pelvic region and thigh	Diagnosis	ICD-9-CM
719.16	Hemarthrosis, lower leg	Diagnosis	ICD-9-CM
719.17	Hemarthrosis, ankle and foot	Diagnosis	ICD-9-CM
719.18	Hemarthrosis, other specified site	Diagnosis	ICD-9-CM
719.19	Hemarthrosis, multiple sites	Diagnosis	ICD-9-CM
784.7	Epistaxis	Diagnosis	ICD-9-CM
784.8	Hemorrhage from throat	Diagnosis	ICD-9-CM
786.3	Hemoptysis	Diagnosis	ICD-9-CM
790.92	Abnormal coagulation profile	Diagnosis	ICD-9-CM

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
Atrial Fibrillation			
427.31	Atrial fibrillation	Diagnosis	ICD-9-CM
427.32	Atrial flutter	Diagnosis	ICD-9-CM
427.3	Atrial fibrillation and flutter	Diagnosis	ICD-9-CM
Deep Vein Thrombosis			
4534	Acute venous embolism and thrombosis of deep vessels of lower extremity	Diagnosis	ICD-9-CM
45340	Acute venous embolism and thrombosis of unspecified deep vessels of lower extremity	Diagnosis	ICD-9-CM
45341	Acute venous embolism and thrombosis of deep vessels of proximal lower extremity	Diagnosis	ICD-9-CM
45342	Acute venous embolism and thrombosis of deep vessels of distal lower extremity	Diagnosis	ICD-9-CM
4511	Phlebitis and thrombophlebitis of deep veins of lower extremities	Diagnosis	ICD-9-CM
45111	Phlebitis and thrombophlebitis of femoral vein (deep) (superficial)	Diagnosis	ICD-9-CM
45119	Phlebitis and thrombophlebitis of deep veins of lower extremities, other	Diagnosis	ICD-9-CM
4512	Phlebitis and thrombophlebitis of lower extremities, unspecified	Diagnosis	ICD-9-CM
45181	Phlebitis and thrombophlebitis of iliac vein	Diagnosis	ICD-9-CM
45183	Phlebitis and thrombophlebitis of deep veins of upper extremities	Diagnosis	ICD-9-CM
45384	Phlebitis and thrombophlebitis of upper extremities, unspecified	Diagnosis	ICD-9-CM
453.5	Chronic venous embolism and thrombosis of deep vessels of lower extremity	Diagnosis	ICD-9-CM
453.50	Chronic venous embolism and thrombosis of unspecified deep vessels of lower extremity	Diagnosis	ICD-9-CM
453.51	Chronic venous embolism and thrombosis of deep vessels of proximal lower extremity	Diagnosis	ICD-9-CM
453.52	Chronic venous embolism and thrombosis of deep vessels of distal lower extremity	Diagnosis	ICD-9-CM
Pulmonary Embolism			
4151	Pulmonary embolism and infarction	Diagnosis	ICD-9-CM
41511	Iatrogenic pulmonary embolism and infarction	Diagnosis	ICD-9-CM
41512	Septic pulmonary embolism	Diagnosis	ICD-9-CM
41519	Other pulmonary embolism and infarction	Diagnosis	ICD-9-CM
415.13	Saddle embolus of pulmonary artery	Diagnosis	ICD-9-CM
Hip Surgery			
01214	Anesthesia for open procedures involving hip joint; total hip arthroplasty	Procedure	CPT-4
01215	Anesthesia for open procedures involving hip joint; revision of total hip arthroplasty	Procedure	CPT-4
27132	Conversion of previous hip surgery to total hip arthroplasty, with or without autograft or	Procedure	CPT-4
27134	Revision of total hip arthroplasty; both components, with or without autograft or allograft	Procedure	CPT-4
27137	Revision of total hip arthroplasty; acetabular component only, with or without autograft or	Procedure	CPT-4
27138	Revision of total hip arthroplasty; femoral component only, with or without allograft	Procedure	CPT-4
27130	Arthroplasty, acetabular and proximal femoral prosthetic replacement (total hip arthroplasty), with or without autograft or allograft	Procedure	CPT-4
27131	Arthroplasty, Acetabular And Proximal Femoral	Procedure	CPT-4
27218	Open treatment of posterior pelvic bone fracture and/or dislocation, for fracture patterns that disrupt the pelvic ring, unilateral, includes internal fixation, when performed (includes ipsilateral ilium, sacroiliac joint and/or sacrum)	Procedure	CPT-4
27226	Open treatment of posterior or anterior acetabular wall fracture, with internal fixation	Procedure	CPT-4
27227	Open treatment of acetabular fracture(s) involving anterior or posterior (one) column, or a fracture running transversely across the acetabulum, with internal fixation	Procedure	CPT-4

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
27228	Open treatment of acetabular fracture(s) involving anterior and posterior (two) columns, includes T-fracture and both column fracture with complete articular detachment, or single column or transverse fracture with associated acetabular wall fracture, with internal fixation	Procedure	CPT-4
27253	Open treatment of hip dislocation, traumatic, without internal fixation	Procedure	CPT-4
27258	Open treatment of spontaneous hip dislocation (developmental, including congenital or pathological), replacement of femoral head in acetabulum (including tenotomy, etc);	Procedure	CPT-4
27259	Open treatment of spontaneous hip dislocation (developmental, including congenital or pathological), replacement of femoral head in acetabulum (including tenotomy, etc); with	Procedure	CPT-4
27299	Unlisted procedure, pelvis or hip joint	Procedure	CPT-4
29861	Arthroscopy, hip, surgical; with removal of loose body or foreign body	Procedure	CPT-4
29862	Arthroscopy, hip, surgical; with debridement/shaving of articular cartilage (chondroplasty), abrasion arthroplasty, and/or resection of labrum	Procedure	CPT-4
29863	Arthroscopy, hip, surgical; with synovectomy	Procedure	CPT-4
79.85	Open Reduction of Dislocation of Hip	Procedure	ICD-9-CM
80.45	Division joint capsule ligament or cartilage hip	Procedure	ICD-9-CM
80.85	Other local excision/destruction lesion hip joint	Procedure	ICD-9-CM
80.95	Other excision of hip joint	Procedure	ICD-9-CM
81.40	Repair of hip not elsewhere classified	Procedure	ICD-9-CM
81.51	Total hip replacement	Procedure	ICD-9-CM
81.52	Partial hip replacement	Procedure	ICD-9-CM
81.53	Revision of hip replacement nos	Procedure	ICD-9-CM
84.18	Disarticulation of hip	Procedure	ICD-9-CM
00.70	Other hip procedures	Procedure	ICD-9-CM
00.71	Other hip procedures	Procedure	ICD-9-CM
00.72	Other hip procedures	Procedure	ICD-9-CM
00.73	Other hip procedures	Procedure	ICD-9-CM
00.74	Other hip procedures	Procedure	ICD-9-CM
00.75	Other hip procedures	Procedure	ICD-9-CM
00.76	Other hip procedures	Procedure	ICD-9-CM
00.77	Other hip procedures	Procedure	ICD-9-CM
00.78	Other hip procedures	Procedure	ICD-9-CM
00.79	Other hip procedures	Procedure	ICD-9-CM
00.7	Other hip procedures	Procedure	ICD-9-CM
Knee Surgery			
01402	Anesthesia for open or surgical arthroscopic procedures on knee joint; total knee arthroplasty	Procedure	CPT-4
27447	Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty)	Procedure	CPT-4
27486	Revision of total knee arthroplasty, with or without allograft; 1 component	Procedure	CPT-4
27487	Revision of total knee arthroplasty, with or without allograft; femoral and entire tibial	Procedure	CPT-4
79.86	Open reduction of dislocation of knee	Procedure	ICD-9-CM
80.46	Division joint capsule ligament/cartilage knee	Procedure	ICD-9-CM
80.86	Other local excision/destruction lesion knee joint	Procedure	ICD-9-CM
80.96	Other excision of knee joint	Procedure	ICD-9-CM

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
81.42	Five-in-one repair of knee	Procedure	ICD-9-CM
81.43	Triad knee repair	Procedure	ICD-9-CM
81.54	Total knee replacement	Procedure	ICD-9-CM
81.55	Revision of knee replacement nos	Procedure	ICD-9-CM
84.16	Disarticulation of knee	Procedure	ICD-9-CM
00.80	Other knee procedures	Procedure	ICD-9-CM
00.81	Other knee procedures	Procedure	ICD-9-CM
00.82	Other knee procedures	Procedure	ICD-9-CM
00.83	Other knee procedures	Procedure	ICD-9-CM
00.84	Other knee procedures	Procedure	ICD-9-CM
00.85	Other knee procedures	Procedure	ICD-9-CM
00.86	Other knee procedures	Procedure	ICD-9-CM
00.87	Other knee procedures	Procedure	ICD-9-CM
00.88	Other knee procedures	Procedure	ICD-9-CM
00.89	Other knee procedures	Procedure	ICD-9-CM
00.8	Other knee procedures	Procedure	ICD-9-CM
80.6	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.60	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.61	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.62	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.63	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.64	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.65	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.66	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.67	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.68	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
80.69	Excision of semilunar cartilage of knee	Procedure	ICD-9-CM
Spinal Surgery			
20930	Allograft, morselized, or placement of osteopromotive material, for spine surgery only (List separately in addition to code for primary procedure)	Procedure	CPT-4
20931	Allograft, structural, for spine surgery only (List separately in addition to code for primary	Procedure	CPT-4
20936	Autograft for spine surgery only (includes harvesting the graft); local (eg, ribs, spinous process, or laminar fragments) obtained from same incision (List separately in addition to	Procedure	CPT-4
20937	Autograft for spine surgery only (includes harvesting the graft); morselized (through separate skin or fascial incision) (List separately in addition to code for primary procedure)	Procedure	CPT-4
20938	Autograft for spine surgery only (includes harvesting the graft); structural, bicortical or tricortical (through separate skin or fascial incision) (List separately in addition to code for primary procedure)	Procedure	CPT-4
22010	Incision and drainage, open, of deep abscess (subfascial), posterior spine; cervical, thoracic,	Procedure	CPT-4
22015	Incision and drainage, open, of deep abscess (subfascial), posterior spine; lumbar, sacral, or	Procedure	CPT-4
22100	Partial excision of posterior vertebral component (eg, spinous process, lamina or facet) for intrinsic bony lesion, single vertebral segment; cervical	Procedure	CPT-4
22101	Partial excision of posterior vertebral component (eg, spinous process, lamina or facet) for intrinsic bony lesion, single vertebral segment; thoracic	Procedure	CPT-4

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
22102	Partial excision of posterior vertebral component (eg, spinous process, lamina or facet) for intrinsic bony lesion, single vertebral segment; lumbar	Procedure	CPT-4
22103	Partial excision of posterior vertebral component (eg, spinous process, lamina or facet) for intrinsic bony lesion, single vertebral segment; each additional segment (List separately in addition to code for primary procedure)	Procedure	CPT-4
22105	Part resect vertebral component tumor; CERV	Procedure	CPT-4
22106	Part resect vertebral component tumor; thoracic	Procedure	CPT-4
22107	Part resect vertebral component tumor; lumbar	Procedure	CPT-4
22110	Partial excision of vertebral body, for intrinsic bony lesion, without decompression of spinal cord or nerve root(s), single vertebral segment; cervical	Procedure	CPT-4
22111	Partial Excision (craterization, Saucerization) Of Vertebrae	Procedure	CPT-4
22112	Partial excision of vertebral body, for intrinsic bony lesion, without decompression of spinal cord or nerve root(s), single vertebral segment; thoracic	Procedure	CPT-4
22113	Partial Excision (craterization, Saucerization) Of Vertebrae	Procedure	CPT-4
22114	Partial excision of vertebral body, for intrinsic bony lesion, without decompression of spinal cord or nerve root(s), single vertebral segment; lumbar	Procedure	CPT-4
22115	Partial Excision (craterization, Saucerization) Of Vertebrae	Procedure	CPT-4
22116	Partial excision of vertebral body, for intrinsic bony lesion, without decompression of spinal cord or nerve root(s), single vertebral segment; each additional vertebral segment (List separately in addition to code for primary procedure)	Procedure	CPT-4
22206	Osteotomy of spine, posterior or posterolateral approach, 3 columns, 1 vertebral segment (eg, pedicle/vertebral body subtraction); thoracic	Procedure	CPT-4
22207	Osteotomy of spine, posterior or posterolateral approach, 3 columns, 1 vertebral segment (eg, pedicle/vertebral body subtraction); lumbar	Procedure	CPT-4
22208	Osteotomy of spine, posterior or posterolateral approach, 3 columns, 1 vertebral segment (eg, pedicle/vertebral body subtraction); each additional vertebral segment (List separately	Procedure	CPT-4
22210	Osteotomy of spine, posterior or posterolateral approach, 1 vertebral segment; cervical	Procedure	CPT-4
22212	Osteotomy of spine, posterior or posterolateral approach, 1 vertebral segment; thoracic	Procedure	CPT-4
22214	Osteotomy of spine, posterior or posterolateral approach, 1 vertebral segment; lumbar	Procedure	CPT-4
22216	Osteotomy of spine, posterior or posterolateral approach, 1 vertebral segment; each additional vertebral segment (List separately in addition to primary procedure)	Procedure	CPT-4
22220	Osteotomy of spine, including discectomy, anterior approach, single vertebral segment;	Procedure	CPT-4
22222	Osteotomy of spine, including discectomy, anterior approach, single vertebral segment;	Procedure	CPT-4
22224	Osteotomy of spine, including discectomy, anterior approach, single vertebral segment;	Procedure	CPT-4
22226	Osteotomy of spine, including discectomy, anterior approach, single vertebral segment; each additional vertebral segment (List separately in addition to code for primary procedure)	Procedure	CPT-4
22318	Open treatment and/or reduction of odontoid fracture(s) and or dislocation(s) (including os odontoideum), anterior approach, including placement of internal fixation; without grafting	Procedure	CPT-4
22319	Open treatment and/or reduction of odontoid fracture(s) and or dislocation(s) (including os odontoideum), anterior approach, including placement of internal fixation; with grafting	Procedure	CPT-4
22325	Open treatment and/or reduction of vertebral fracture(s) and/or dislocation(s), posterior approach, 1 fractured vertebra or dislocated segment; lumbar	Procedure	CPT-4

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
22326	Open treatment and/or reduction of vertebral fracture(s) and/or dislocation(s), posterior approach, 1 fractured vertebra or dislocated segment; cervical	Procedure	CPT-4
22327	Open treatment and/or reduction of vertebral fracture(s) and/or dislocation(s), posterior approach, 1 fractured vertebra or dislocated segment; thoracic	Procedure	CPT-4
22328	Open treatment and/or reduction of vertebral fracture(s) and/or dislocation(s), posterior approach, 1 fractured vertebra or dislocated segment; each additional fractured vertebra or dislocated segment (List separately in addition to code for primary procedure)	Procedure	CPT-4
22532	Arthrodesis, lateral extracavitary technique, including minimal discectomy to prepare interspace (other than for decompression); thoracic	Procedure	CPT-4
22533	Arthrodesis, lateral extracavitary technique, including minimal discectomy to prepare interspace (other than for decompression); lumbar	Procedure	CPT-4
22534	Arthrodesis, lateral extracavitary technique, including minimal discectomy to prepare interspace (other than for decompression); thoracic or lumbar, each additional vertebral segment (List separately in addition to code for primary procedure)	Procedure	CPT-4
22548	Arthrodesis, anterior transoral or extraoral technique, clivus-C1-C2 (atlas-axis), with or without excision of odontoid process	Procedure	CPT-4
22550	Arthrodesis With Diskectomy, Cervical,	Procedure	CPT-4
22551	Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophytectomy and decompression of spinal cord and/or nerve roots; cervical below C2	Procedure	CPT-4
22552	Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophytectomy and decompression of spinal cord and/or nerve roots; cervical below C2, each additional interspace (List separately in addition to code for separate procedure)	Procedure	CPT-4
22554	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); cervical below C2	Procedure	CPT-4
22555	Arthrodesis With Diskectomy, Cervical, Anterior	Procedure	CPT-4
22556	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); thoracic	Procedure	CPT-4
22558	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); lumbar	Procedure	CPT-4
22560	Arthrodesis With Diskectomy, Lumbar Or Thoracic,	Procedure	CPT-4
22561	Arthrodesis With Diskectomy, Lumbar Or Thoracic,	Procedure	CPT-4
22565	Arthrodesis With Diskectomy, Lower Lumbar Spine,	Procedure	CPT-4
22585	Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); each additional interspace (List separately in	Procedure	CPT-4
22590	Arthrodesis, posterior technique, craniocervical (occiput-C2)	Procedure	CPT-4
22595	Arthrodesis, posterior technique, atlas-axis (C1-C2)	Procedure	CPT-4
22600	Arthrodesis, posterior or posterolateral technique, single level; cervical below C2 segment	Procedure	CPT-4
22605	Cervical Fusion, Posterior Approach, Below C1 Level;	Procedure	CPT-4
22610	Arthrodesis, posterior or posterolateral technique, single level; thoracic (with lateral transverse technique, when performed)	Procedure	CPT-4
22612	Arthrodesis, posterior or posterolateral technique, single level; lumbar (with lateral transverse technique, when performed)	Procedure	CPT-4
22614	Arthrodesis, posterior or posterolateral technique, single level; each additional vertebral segment (List separately in addition to code for primary procedure)	Procedure	CPT-4
22615	Cervical Fusion, Anterior Approach (c3-t1) With Iliac	Procedure	CPT-4

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
22617	Atlas-axis Fusion (c1-c2 Or C3) With Iliac Or	Procedure	CPT-4
22620	Cervicocranial Fusion (occiput Through C2) With	Procedure	CPT-4
22625	ARTHRODESIS LAT TRANSVERSE W/GFT-INT FIXA LUMBAR	Procedure	CPT-4
22630	Arthrodesis, posterior interbody technique, including laminectomy and/or discectomy to prepare interspace (other than for decompression), single interspace; lumbar	Procedure	CPT-4
22632	Arthrodesis, posterior interbody technique, including laminectomy and/or discectomy to prepare interspace (other than for decompression), single interspace; each additional interspace (List separately in addition to code for primary procedure)	Procedure	CPT-4
22800	Arthrodesis, posterior, for spinal deformity, with or without cast; up to 6 vertebral segments	Procedure	CPT-4
22801	Arthrodesis, Primary For Scoliosis With Or Without	Procedure	CPT-4
22802	Arthrodesis, posterior, for spinal deformity, with or without cast; 7 to 12 vertebral segments	Procedure	CPT-4
22803	Arthrodesis, Primary For Scoliosis With Or Without	Procedure	CPT-4
22804	Arthrodesis, posterior, for spinal deformity, with or without cast; 13 or more vertebral	Procedure	CPT-4
22808	Arthrodesis, anterior, for spinal deformity, with or without cast; 2 to 3 vertebral segments	Procedure	CPT-4
22810	Arthrodesis, anterior, for spinal deformity, with or without cast; 4 to 7 vertebral segments	Procedure	CPT-4
22812	Arthrodesis, anterior, for spinal deformity, with or without cast; 8 or more vertebral	Procedure	CPT-4
22818	Kyphectomy, circumferential exposure of spine and resection of vertebral segment(s) (including body and posterior elements); single or 2 segments	Procedure	CPT-4
22819	Kyphectomy, circumferential exposure of spine and resection of vertebral segment(s) (including body and posterior elements); 3 or more segments	Procedure	CPT-4
22830	Exploration of spinal fusion	Procedure	CPT-4
22840	Posterior non-segmental instrumentation (eg, Harrington rod technique, pedicle fixation across 1 interspace, atlantoaxial transarticular screw fixation, sublaminar wiring at C1, facet screw fixation) (List separately in addition to code for primary procedure)	Procedure	CPT-4
22841	Internal spinal fixation by wiring of spinous processes (List separately in addition to code for	Procedure	CPT-4
22842	Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 3 to 6 vertebral segments (List separately in addition to code for primary	Procedure	CPT-4
22843	Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 7 to 12 vertebral segments (List separately in addition to code for primary procedure)	Procedure	CPT-4
22844	Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 13 or more vertebral segments (List separately in addition to code for primary procedure)	Procedure	CPT-4
22845	Anterior instrumentation; 2 to 3 vertebral segments (List separately in addition to code for primary procedure)	Procedure	CPT-4
22846	Anterior instrumentation; 4 to 7 vertebral segments (List separately in addition to code for primary procedure)	Procedure	CPT-4
22847	Anterior instrumentation; 8 or more vertebral segments (List separately in addition to code for primary procedure)	Procedure	CPT-4
22848	Pelvic fixation (attachment of caudal end of instrumentation to pelvic bony structures) other than sacrum (List separately in addition to code for primary procedure)	Procedure	CPT-4
22849	Reinsertion of spinal fixation device	Procedure	CPT-4
22850	Removal of posterior nonsegmental instrumentation (eg, Harrington rod)	Procedure	CPT-4

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
22851	Application of intervertebral biomechanical device(s) (eg, synthetic cage(s), methylmethacrylate) to vertebral defect or interspace (List separately in addition to code for primary procedure)	Procedure	CPT-4
22852	Removal of posterior segmental instrumentation	Procedure	CPT-4
22855	Removal of anterior instrumentation	Procedure	CPT-4
22856	Total disc arthroplasty (artificial disc), anterior approach, including discectomy with end plate preparation (includes osteophytectomy for nerve root or spinal cord decompression and microdissection); single interspace, cervical	Procedure	CPT-4
22857	Total disc arthroplasty (artificial disc), anterior approach, including discectomy to prepare interspace (other than for decompression), single interspace, lumbar	Procedure	CPT-4
22858	Total disc arthroplasty (artificial disc), anterior approach, including discectomy with end plate preparation (includes osteophytectomy for nerve root or spinal cord decompression and microdissection); second level, cervical (List separately in addition to code for primary procedure)	Procedure	CPT-4
22861	Revision including replacement of total disc arthroplasty (artificial disc), anterior approach, single interspace; cervical	Procedure	CPT-4
22862	Revision including replacement of total disc arthroplasty (artificial disc), anterior approach, single interspace; lumbar	Procedure	CPT-4
22864	Removal of total disc arthroplasty (artificial disc), anterior approach, single interspace; cervical	Procedure	CPT-4
22865	Removal of total disc arthroplasty (artificial disc), anterior approach, single interspace; lumbar	Procedure	CPT-4
03.40	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.41	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.42	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.43	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.44	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.45	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.46	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.47	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.48	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.49	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.4	Excision Or Destruction Of Lesion Of Spinal Cord Or Spinal Meninges	Procedure	ICD-9-CM
03.50	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.51	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.52	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.53	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.54	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.55	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.56	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.57	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.58	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.59	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.5	Plastic Operations On Spinal Cord Structures	Procedure	ICD-9-CM
03.9	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM

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Code	Description	Code	Code Type
03.90	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
03.91	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
03.92	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
03.93	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
03.94	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
03.95	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
03.96	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
03.97	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
03.98	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
03.99	Other Operations On Spinal Cord And Spinal Canal Structures	Procedure	ICD-9-CM
Joint Replacement			
V436	Joint replaced by other means	Procedure	ICD-9-CM
V4360	Unspecified joint replacement by other means	Procedure	ICD-9-CM
V4361	Shoulder joint replacement by other means	Procedure	ICD-9-CM
V4362	Elbow joint replacement by other means	Procedure	ICD-9-CM
V4363	Wrist joint replacement by other means	Procedure	ICD-9-CM
V4364	Hip joint replacement by other means	Procedure	ICD-9-CM
V4365	Knee joint replacement by other means	Procedure	ICD-9-CM
V4366	Ankle joint replacement by other means	Procedure	ICD-9-CM
V4369	Other joint replacement by other means	Procedure	ICD-9-CM
81.5	Joint replacement of lower extremity	Procedure	ICD-9-CM
81.51	Total hip replacement	Procedure	ICD-9-CM
81.52	Partial hip replacement	Procedure	ICD-9-CM
81.53	Revision of hip replacement, not otherwise specified	Procedure	ICD-9-CM
81.54	Total knee replacement	Procedure	ICD-9-CM
81.55	Revision of knee replacement, not otherwise specified	Procedure	ICD-9-CM
81.56	Total ankle replacement	Procedure	ICD-9-CM
81.57	Replacement of joint of foot and toe	Procedure	ICD-9-CM
81.59	Revision of joint replacement of lower extremity, not elsewhere classified	Procedure	ICD-9-CM
81.8	Arthroplasty and repair of shoulder and elbow	Procedure	ICD-9-CM
81.80	Total shoulder replacement	Procedure	ICD-9-CM
81.81	Partial shoulder replacement	Procedure	ICD-9-CM
81.82	Repair of recurrent dislocation of shoulder	Procedure	ICD-9-CM
81.83	Other repair of shoulder	Procedure	ICD-9-CM
81.84	Total elbow replacement	Procedure	ICD-9-CM
81.85	Other repair of elbow	Procedure	ICD-9-CM
81.88	Reverse total shoulder replacement	Procedure	ICD-9-CM
0202T	Posterior vertebral joint(s) arthroplasty (eg, facet joint[s] replacement), including facetectomy, laminectomy, foraminotomy, and vertebral column fixation, injection of bone cement, when performed, including fluoroscopy, single level, lumbar spine	Procedure	CPT-3
0375T	Total disc arthroplasty (artificial disc), anterior approach, including discectomy with end plate preparation (includes osteophytectomy for nerve root or spinal cord decompression and microdissection), cervical, three or more levels	Procedure	CPT-3
21243	Arthroplasty, temporomandibular joint, with prosthetic joint replacement	Procedure	CPT-4

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
23472	Arthroplasty, glenohumeral joint; total shoulder (glenoid and proximal humeral replacement (eg, total shoulder))	Procedure	CPT-4
24361	Arthroplasty, elbow; with distal humeral prosthetic replacement	Procedure	CPT-4
24363	Arthroplasty, elbow; with distal humerus and proximal ulnar prosthetic replacement (eg, total elbow)	Procedure	CPT-4
24666	Open treatment of radial head or neck fracture, includes internal fixation or radial head excision, when performed; with radial head prosthetic replacement	Procedure	CPT-4
25441	Arthroplasty with prosthetic replacement; distal radius	Procedure	CPT-4
25442	Arthroplasty with prosthetic replacement; distal ulna	Procedure	CPT-4
25443	Arthroplasty with prosthetic replacement; scaphoid carpal (navicular)	Procedure	CPT-4
25444	Arthroplasty with prosthetic replacement; lunate	Procedure	CPT-4
25445	Arthroplasty with prosthetic replacement; trapezium	Procedure	CPT-4
25446	Arthroplasty with prosthetic replacement; distal radius and partial or entire carpus (total wrist)	Procedure	CPT-4
27125	Hemiarthroplasty, hip, partial (eg, femoral stem prosthesis, bipolar arthroplasty)	Procedure	CPT-4
27130	Arthroplasty, acetabular and proximal femoral prosthetic replacement (total hip arthroplasty), with or without autograft or allograft	Procedure	CPT-4
27132	Conversion of previous hip surgery to total hip arthroplasty, with or without autograft or allograft	Procedure	CPT-4
27134	Revision of total hip arthroplasty; both components, with or without autograft or allograft	Procedure	CPT-4
27137	Revision of total hip arthroplasty; acetabular component only, with or without autograft or allograft	Procedure	CPT-4
27138	Revision of total hip arthroplasty; femoral component only, with or without allograft	Procedure	CPT-4
27447	Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty)	Procedure	CPT-4
27486	Revision of total knee arthroplasty, with or without allograft; 1 component	Procedure	CPT-4
27487	Revision of total knee arthroplasty, with or without allograft; femoral and entire tibial component	Procedure	CPT-4
L8631	Metacarpal phalangeal joint replacement, 2 or more pieces, metal (e.g., stainless steel or cobalt chrome), ceramic-like material (e.g., pyrocarbon), for surgical implantation (all sizes, includes entire system)	Procedure	HCPCS
L8659	Interphalangeal finger joint replacement, 2 or more pieces, metal (e.g., stainless steel or cobalt chrome), ceramic-like material (e.g., pyrocarbon) for surgical implantation, any size	Procedure	HCPCS
Mitral Stenosis			
394	Diseases of mitral valve	Procedure	ICD-9-CM
394.0	Mitral stenosis	Procedure	ICD-9-CM
394.1	Rheumatic mitral insufficiency	Procedure	ICD-9-CM
394.2	Mitral stenosis with insufficiency	Procedure	ICD-9-CM
394.9	Other and unspecified mitral valve diseases	Procedure	ICD-9-CM
396.0	Mitral valve stenosis and aortic valve stenosis	Procedure	ICD-9-CM
396.1	Mitral valve stenosis and aortic valve insufficiency	Procedure	ICD-9-CM
396.8	Multiple involvement of mitral and aortic valves	Procedure	ICD-9-CM
Valve Replacement			

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Code	Description	Code	Code Type
V422	Heart valve replaced by transplant	Procedure	ICD-9-CM
V433	Heart valve replaced by other means	Procedure	ICD-9-CM
35.2	Replacement of heart valve	Procedure	ICD-9-CM
35.20	Replacement of unspecified heart valve	Procedure	ICD-9-CM
35.21	Replacement of aortic valve with tissue graft	Procedure	ICD-9-CM
35.22	Other replacement of aortic valve	Procedure	ICD-9-CM
35.23	Replacement of mitral valve with tissue graft	Procedure	ICD-9-CM
35.24	Other replacement of mitral valve	Procedure	ICD-9-CM
35.25	Replacement of pulmonary valve with tissue graft	Procedure	ICD-9-CM
35.26	Other replacement of pulmonary valve	Procedure	ICD-9-CM
35.27	Replacement of tricuspid valve with tissue graft	Procedure	ICD-9-CM
35.28	Other replacement of tricuspid valve	Procedure	ICD-9-CM
0258T	Transthoracic cardiac exposure (eg, sternotomy, thoracotomy, subxiphoid) for catheter-delivered aortic valve replacement; without cardiopulmonary bypass	Procedure	CPT-3
0259T	Transthoracic cardiac exposure (eg, sternotomy, thoracotomy, subxiphoid) for catheter-delivered aortic valve replacement; with cardiopulmonary bypass	Procedure	CPT-3
0318T	Implantation of catheter-delivered prosthetic aortic heart valve, open thoracic approach, (eg, transapical, other than transaortic)	Procedure	CPT-3
33361	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; percutaneous femoral artery approach	Procedure	CPT-4
33362	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; open femoral artery approach	Procedure	CPT-4
33363	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; open axillary artery approach	Procedure	CPT-4
33364	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; open iliac artery approach	Procedure	CPT-4
33365	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; transaortic approach (eg, median sternotomy, mediastinotomy)	Procedure	CPT-4
33366	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; transapical exposure (eg, left thoracotomy)	Procedure	CPT-4
33367	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; cardiopulmonary bypass support with percutaneous peripheral arterial and venous cannulation (eg, femoral vessels) (List separately in addition to code for primary procedure)	Procedure	CPT-4
33368	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; cardiopulmonary bypass support with open peripheral arterial and venous cannulation (eg, femoral, iliac, axillary vessels) (List separately in addition to code for primary procedure)	Procedure	CPT-4
33369	Transcatheter aortic valve replacement (TAVR/TAVI) with prosthetic valve; cardiopulmonary bypass support with central arterial and venous cannulation (eg, aorta, right atrium, pulmonary artery) (List separately in addition to code for primary procedure)	Procedure	CPT-4
33405	Replacement, aortic valve, open, with cardiopulmonary bypass; with prosthetic valve other than homograft or stentless valve	Procedure	CPT-4

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Code	Description	Code	Code Type
33406	Replacement, aortic valve, open, with cardiopulmonary bypass; with allograft valve (freehand)	Procedure	CPT-4
33410	Replacement, aortic valve, open, with cardiopulmonary bypass; with stentless tissue valve	Procedure	CPT-4
33411	Replacement, aortic valve; with aortic annulus enlargement, noncoronary sinus	Procedure	CPT-4
33412	Replacement, aortic valve; with transventricular aortic annulus enlargement (Konno procedure)	Procedure	CPT-4
33413	Replacement, aortic valve; by translocation of autologous pulmonary valve with allograft replacement of pulmonary valve (Ross procedure)	Procedure	CPT-4
33418	Transcatheter mitral valve repair, percutaneous approach, including transseptal puncture when performed; initial prosthesis	Procedure	CPT-4
33419	Transcatheter mitral valve repair, percutaneous approach, including transseptal puncture when performed; additional prosthesis(es) during same session (List separately in addition to code for primary procedure)	Procedure	CPT-4
33430	Replacement, mitral valve, with cardiopulmonary bypass	Procedure	CPT-4
33465	Replacement, tricuspid valve, with cardiopulmonary bypass	Procedure	CPT-4
33475	Replacement, pulmonary valve	Procedure	CPT-4
Valve Repair			
0345T	Transcatheter mitral valve repair percutaneous approach via the coronary sinus	Procedure	CPT-3
33400	Valvuloplasty, aortic valve; open, with cardiopulmonary bypass	Procedure	CPT-4
33401	Valvuloplasty, aortic valve; open, with inflow occlusion	Procedure	CPT-4
33403	Valvuloplasty, aortic valve; using transventricular dilation, with cardiopulmonary bypass	Procedure	CPT-4
33420	Valvotomy, mitral valve; closed heart	Procedure	CPT-4
33422	Valvotomy, mitral valve; open heart, with cardiopulmonary bypass	Procedure	CPT-4
33425	Valvuloplasty, mitral valve, with cardiopulmonary bypass;	Procedure	CPT-4
33426	Valvuloplasty, mitral valve, with cardiopulmonary bypass; with prosthetic ring	Procedure	CPT-4
33427	Valvuloplasty, mitral valve, with cardiopulmonary bypass; radical reconstruction, with or without ring	Procedure	CPT-4
33460	Valvectomy, tricuspid valve, with cardiopulmonary bypass	Procedure	CPT-4
33463	Valvuloplasty, tricuspid valve; without ring insertion	Procedure	CPT-4
33464	Valvuloplasty, tricuspid valve; with ring insertion	Procedure	CPT-4
33468	Tricuspid valve repositioning and plication for Ebstein anomaly	Procedure	CPT-4
33470	Valvotomy, pulmonary valve, closed heart; transventricular	Procedure	CPT-4
33471	Valvotomy, pulmonary valve, closed heart; via pulmonary artery	Procedure	CPT-4
33472	Valvotomy, pulmonary valve, open heart; with inflow occlusion	Procedure	CPT-4
33474	Valvotomy, pulmonary valve, open heart, with cardiopulmonary bypass	Procedure	CPT-4
33476	Right ventricular resection for infundibular stenosis, with or without commissurotomy	Procedure	CPT-4
33496	Repair of non-structural prosthetic valve dysfunction with cardiopulmonary bypass (separate procedure)	Procedure	CPT-4
92986	Percutaneous balloon valvuloplasty; aortic valve	Procedure	CPT-4
92987	Percutaneous balloon valvuloplasty; mitral valve	Procedure	CPT-4
92990	Percutaneous balloon valvuloplasty; pulmonary valve	Procedure	CPT-4
Kidney Transplant			
996.81	Complications of transplanted kidney	Procedure	ICD-9-CM

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Code	Description	Code	Code Type
V42	Organ or tissue replaced by transplant	Procedure	ICD-9-CM
V420	Kidney replaced by transplant	Procedure	ICD-9-CM
55.6	Transplant of kidney	Procedure	ICD-9-CM
55.61	Renal autotransplantation	Procedure	ICD-9-CM
55.69	Other kidney transplantation	Procedure	ICD-9-CM
Dialysis			
792.5	Cloudy (hemodialysis) (peritoneal) dialysis affluent	Procedure	ICD-9-CM
V45.1	Renal dialysis status	Procedure	ICD-9-CM
V45.11	Renal dialysis status	Procedure	ICD-9-CM
V45.12	Noncompliance with renal dialysis	Procedure	ICD-9-CM
V56.0	Encounter for extracorporeal dialysis	Procedure	ICD-9-CM
V56.1	Fitting and adjustment of extracorporeal dialysis catheter	Procedure	ICD-9-CM
V56.2	Fitting and adjustment of peritoneal dialysis catheter	Procedure	ICD-9-CM
V56.3	Encounter for adequacy testing for dialysis	Procedure	ICD-9-CM
V56.31	Encounter for adequacy testing for hemodialysis	Procedure	ICD-9-CM
V56.32	Encounter for adequacy testing for peritoneal dialysis	Procedure	ICD-9-CM
V56.8	Encounter other dialysis	Procedure	ICD-9-CM
90935	Hemodialysis procedure with single evaluation by a physician or other qualified health care professional	Procedure	CPT-4
90937	Hemodialysis procedure requiring repeated evaluation(s) with or without substantial revision of dialysis prescription	Procedure	CPT-4
90939	Hemodialysis access flow study to determine blood flow in grafts and arteriovenous fistulae by an indicator dilution method, hook-up; transcutaneous measurement and disconnection	Procedure	CPT-4
90940	Hemodialysis access flow study to determine blood flow in grafts and arteriovenous fistulae by an indicator method	Procedure	CPT-4
90941	Hemodialysis, For Acute Renal Failure And Or Intoxication,	Procedure	CPT-4
90942	Hemodialysis, For Acute Renal Failure And Or Intoxication,	Procedure	CPT-4
90943	Hemodialysis, For Acute Renal Failure And Or Intoxication,	Procedure	CPT-4
90944	Hemodialysis, For Acute Renal Failure And Or Intoxication,	Procedure	CPT-4
90945	Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies), with single evaluation by a physician or other qualified health care professional	Procedure	CPT-4
90947	Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies) requiring repeated evaluations by a physician or other qualified health care professional, with or without substantial revision of dialysis prescription	Procedure	CPT-4
90951	End-stage renal disease (ESRD) related services monthly, for patients younger than 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 4 or more face-to-face visits by a physician or other qualified health care professional per month	Procedure	CPT-4
90952	End-stage renal disease (ESRD) related services monthly, for patients younger than 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 2-3 face-to-face visits by a physician or other qualified health care professional per month	Procedure	CPT-4

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
90953	End-stage renal disease (ESRD) related services monthly, for patients younger than 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 1 face-to-face visit by a physician or other qualified health care professional per month	Procedure	CPT-4
90954	End-stage renal disease (ESRD) related services monthly, for patients 2-11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 4 or more face-to-face visits by a physician or other qualified health care professional per month	Procedure	CPT-4
90955	End-stage renal disease (ESRD) related services monthly, for patients 2-11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 2-3 face-to-face visits by a physician or other qualified health care professional per month	Procedure	CPT-4
90956	End-stage renal disease (ESRD) related services monthly, for patients 2-11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 1 face-to-face visit by a physician or other qualified health care professional per month	Procedure	CPT-4
90957	End-stage renal disease (ESRD) related services monthly, for patients 12-19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 4 or more face-to-face visits by a physician or other qualified health care professional per month	Procedure	CPT-4
90958	End-stage renal disease (ESRD) related services monthly, for patients 12-19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 2-3 face-to-face visits by a physician or other qualified health care professional per month	Procedure	CPT-4
90959	End-stage renal disease (ESRD) related services monthly, for patients 12-19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents; with 1 face-to-face visit by a physician or other qualified health care professional per month	Procedure	CPT-4
90960	End-stage renal disease (ESRD) related services monthly, for patients 20 years of age and older; with 4 or more face-to-face visits by a physician or other qualified health care professional per month	Procedure	CPT-4
90961	End-stage renal disease (ESRD) related services monthly, for patients 20 years of age and older; with 2-3 face-to-face visits by a physician or other qualified health care professional per month	Procedure	CPT-4
90962	End-stage renal disease (ESRD) related services monthly, for patients 20 years of age and older; with 1 face-to-face visit by a physician or other qualified health care professional per month	Procedure	CPT-4
90963	End-stage renal disease (ESRD) related services for home dialysis per full month, for patients younger than 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents	Procedure	CPT-4
90964	End-stage renal disease (ESRD) related services for home dialysis per full month, for patients 2-11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents	Procedure	CPT-4

Appendix D. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) Diagnosis and Procedure Codes Used to Define Covariates in this Request

Code	Description	Code	Code Type
90965	End-stage renal disease (ESRD) related services for home dialysis per full month, for patients 12-19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents	Procedure	CPT-4
90966	End-stage renal disease (ESRD) related services for home dialysis per full month, for patients 20 years of age and older	Procedure	CPT-4
90967	End-stage renal disease (ESRD) related services for dialysis less than a full month of service, per day; for patients younger than 2 years of age	Procedure	CPT-4
90968	End-stage renal disease (ESRD) related services for dialysis less than a full month of service, per day; for patients 2-11 years of age	Procedure	CPT-4
90969	End-stage renal disease (ESRD) related services for dialysis less than a full month of service, per day; for patients 12-19 years of age	Procedure	CPT-4
90970	End-stage renal disease (ESRD) related services for dialysis less than a full month of service, per day; for patients 20 years of age and older	Procedure	CPT-4
90976	Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure	CPT-4
90977	Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure	CPT-4
90978	Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure	CPT-4
90979	Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure	CPT-4
90982	Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure	CPT-4
90983	Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure	CPT-4
90984	Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure	CPT-4
90985	Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure	CPT-4
90988	Supervision Of Hemodialysis In Hospital Or Other Facility (excluding Home Dialysis), On Monthly Basis	Procedure	CPT-4
90989	Dialysis training, patient, including helper where applicable, any mode, completed course	Procedure	CPT-4
90990	Hemodialysis Training And/or Counseling	Procedure	CPT-4
90991	Home Hemodialysis Care, Outpatient, For Those Services Either Provided By The Physician Primarily Responsible	Procedure	CPT-4
90992	Peritoneal Dialysis Training And/or Counseling	Procedure	CPT-4
90993	Dialysis training, patient, including helper where applicable, any mode, course not completed, per training session	Procedure	CPT-4
90994	Supervision Of Chronic Ambulatory Peritoneal Dialysis (capd), Home Or Out-patient (monthly)	Procedure	CPT-4
90995	End Stage Renal Disease (esrd) Related Services, Per Full Month	Procedure	CPT-4
90996	Continuous Arteriovenous Hemofiltration (cavh) (per Day)	Procedure	CPT-4
90997	Hemoperfusion (eg, with activated charcoal or resin)	Procedure	CPT-4
90998	End Stage Renal Disease (esrd) Related Services (less Than Full Month), Per Day	Procedure	CPT-4
90999	Unlisted dialysis procedure, inpatient or outpatient	Procedure	CPT-4

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

Query period: October 19, 2010 - September 30, 2015
Coverage requirement: Medical and Drug Coverage
Pre-index enrollment requirement: 183 days
Enrollment gap: 45 days
Age groups: 21-35, 36-50, 51-64 years
Stratifications: Age group

	Exposure								
Cohort	**Index exposure**	**Cohort definition**	**Exposure washout (days)**	**Incident with respect to:**	**Treatment episode gap**	**Exposure episode extension**	**Minimum exposure episode duration**	**Minimum days supplied**	**Censor treatment episode at evidence of:**
1	Apixaban, dabigatran, or rivaroxaban, (all doses)	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Death; *Data Partner (DP) end date; *Query end date; *Disenrollment; *Event
2	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
3	Apixaban, 5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
4	Dabigatran, 75 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
5	Dabigatran, 150 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose *Death; *DP end date; *Query end date; *Disenrollment; *Event
6	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
7	Rivaroxaban, 15 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
8	Rivaroxaban, 20 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
9	Apixaban, dabigatran, or rivaroxaban, (all doses)	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Death; *DP end date; *Query end date; *Disenrollment; *Event
10	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
11	Apixaban, 5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
12	Dabigatran, 75 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
13	Dabigatran, 150 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
14	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
15	Rivaroxaban, 15 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
16	Rivaroxaban, 20 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
17	Apixaban, dabigatran, or rivaroxaban, (all doses)	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Death; *DP end date; *Query end date; *Disenrollment; *Event
18	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
19	Apixaban, 5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
20	Dabigatran, 75 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
21	Dabigatran, 150 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
22	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
23	Rivaroxaban, 15 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
24	Rivaroxaban, 20 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
25	Apixaban, dabigatran, or rivaroxaban, (all doses)	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Death; *DP end date; *Query end date; *Disenrollment; *Event
26	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
27	Apixaban, 5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
28	Dabigatran, 75 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
29	Dabigatran, 150 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
30	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
31	Rivaroxaban, 15 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
32	Rivaroxaban, 20 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
33	Apixaban, dabigatran, or rivaroxaban, (all doses)	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	14 days	14 days	0 days	0 days	*Death; *DP end date; *Query end date; *Disenrollment; *Event
34	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
35	Apixaban, 5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
36	Dabigatran, 75 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
37	Dabigatran, 150 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose *Death; *DP end date; *Query end date; *Disenrollment; *Event
38	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
39	Rivaroxaban, 15 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
40	Rivaroxaban, 20 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
41	Apixaban, dabigatran, or rivaroxaban, (all doses)	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Death; *DP end date; *Query end date; *Disenrollment; *Event
42	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
43	Apixaban, 5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
44	Dabigatran, 75 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
45	Dabigatran, 150 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
46	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
47	Rivaroxaban, 15 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
48	Rivaroxaban, 20 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
49	Apixaban, dabigatran, or rivaroxaban, (all doses)	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Death; *DP end date; *Query end date; *Disenrollment; *Event
50	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
51	Apixaban, 5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
52	Dabigatran, 75 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
53	Dabigatran, 150 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
54	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
55	Rivaroxaban, 15 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
56	Rivaroxaban, 20 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
57	Apixaban, dabigatran, or rivaroxaban, (all doses)	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Death; *DP end date; *Query end date; *Disenrollment; *Event
58	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
59	Apixaban, 5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
60	Dabigatran, 75 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
61	Dabigatran, 150 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
62	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
63	Rivaroxaban, 15 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
64	Rivaroxaban, 20 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and warfarin (all doses)	14 days	14 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
65	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
66	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
67	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	Index exposure	Cohort definition	Exposure washout (days)	Incident with respect to:	Treatment episode gap	Exposure episode extension	Minimum exposure episode duration	Minimum days supplied	Censor treatment episode at evidence of:
68	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
69	Apixaban, 2.5 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
70	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
71	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Exposure								
Cohort	**Index exposure**	**Cohort definition**	**Exposure washout (days)**	**Incident with respect to:**	**Treatment episode gap**	**Exposure episode extension**	**exposure episode duration**	**Minimum days supplied**	**Censor treatment episode at evidence of:**
72	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
73	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event
74	Rivaroxaban, 10 mg	First valid incident exposure episode only	183	Apixaban, dabigatran, rivaroxaban, and wafarin (all doses)	3 days	3 days	0 days	0 days	*Switch to other treatment **OR** dose; *Death; *DP end date; *Query end date; *Disenrollment; *Event

International Classification of Disease, Ninth Revision (ICD-9), International Classification of Disease, Tenth Revision (ICD-10), Healthcare Common Procedure Coding System (HCPCS), and Current Procedural Terminology (CPT) codes are provided by Optum360. National Drug Codes (NDC) are checked against First Data Bank's "National Drug Data File (NDDF®) Plus."

[1] **Gastrointestinal bleeding is defined as evidence of codes in Appendix C.**

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
1	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	Inpatient hospital stay (IP)	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	Inpatient hospital stay (IP)	183 days
2	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
3	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
4	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
5	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
6	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
7	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
8	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
9	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
10	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
11	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
12	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
13	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
14	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
15	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
16	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
17	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	-183 to 0	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
18	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	-183 to 0	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
19	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
20	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
21	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
22	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
23	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
24	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
25	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
26	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	-183 to 0	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
27	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
28	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
29	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
30	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
31	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
32	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
33	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
34	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
35	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
36	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
37	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
38	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
39	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
40	---	---	---	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
41	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
42	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
43	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

Appendix E. Specifications Defining Parameters for this Request

The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
44	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
45	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
46	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
47	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

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	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
48	---	---	---	See Appendix D	-183 to 0	Intracranial hemorrhage (ICH)	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
49	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
50	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
51	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

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The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
52	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
53	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
54	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
55	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

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	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
56	---	---	---	See Appendix D	-183 to 0	Gastrointestinal bleeding[1]	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
57	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
58	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
59	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

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	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
60	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
61	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
62	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
63	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days

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The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
64	---	---	---	See Appendix D	-183 to 0	Other extracranial bleeding	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
65	Include	Atrial fibrillation	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude		-183 to 0							
66	Include	Atrial fibrillation	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude	PE, DVT	-183 to 0							
67	Include	PE/DVT	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude	Atrial fibrillation	-183 to 0							

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The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
68	Include	---	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude	Atrial fibrillation, PE, DVT	-183 to 0							
69	Include	Select surgeries	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude		-183 to 0							
70	Include	Atrial fibrillation	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude		-183 to 0							
71	Include	Atrial fibrillation	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude	PE, DVT	-183 to 0							

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The goal of this query was to examine utilization and characteristics of non-vitamin K antagonist oral anticoagulants (NOACs) initiators (including dabigatran, rivaroxaban, and apixaban) in those betwen the ages of 21 and 64 years in the Sentinel Distributed Database (SDD). This is report 1 of 2. The second report assesses follow-up time among new NOAC initiators.

	Inclusion / Exclusion			Characteristics		Event Outcome				
Cohort	Include/ Exclude	Condition	Evaluation period	Characteristics	Evaluation period (days)	Event	Care Settings	Washout Conditions	Washout Care Settings	Event washout (days)
72	Include	PE/DVT	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude	Atrial fibrillation	-183 to 0							
73	Include	---	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude	Atrial fibrillation, PE, DVT	-183 to 0							
74	Include	Select surgeries	-183 to 0	See Appendix D	-183 to 0	Ischemic Stroke	IP	Ischemic stroke, intracranial hemorrhage, gastrointestinal bleeding, other extracranial bleeding	IP	183 days
	Exclude		-183 to 0							

International Classification of Disease, Ninth Revision (ICD-9), International Classification of Disease, Tenth Revision (ICD-10), Healthcare Common Procedure Coding System (HCPCS), and Current Procedural Terminology (CPT) codes are provided by Optum360. National Drug Codes (NDC) are checked against First Data Bank's "National Drug Data File (NDDF®) Plus."