

Disclaimer

The FDA chose a specific outcome algorithm that met its need for a given medical product-outcome assessment. The use of a specific outcome algorithm in a Sentinel assessment should not be interpreted as an endorsement from FDA to use the algorithm for all safety assessments. Investigators should always consider the objective, study design, analytic approach, and data source of a given medical product safety assessment when choosing the outcome algorithm. The suitability of an outcome algorithm may change when applied to different scenarios. For additional information, please refer to the guidance document provided by the FDA.

[Best Practices for Conducting and Reporting Pharmacoepidemiologic Safety Studies Using Electronic Healthcare Data](#)

Overview

Title	Venous Thromboembolism Algorithm Defined in "Use of Combined Hormonal Contraceptives or Progestin-only Contraceptives During 6-month Postpartum Period and the Risk of Venous Thromboembolism: A Propensity Score Matched Analysis"
Request ID	cder_mpl2p_wp063
Description	<p>This report lists International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) diagnosis codes, generic and brand names of medical products, and algorithms used to define venous thromboembolism in this request.</p> <p>For additional information about the algorithm and how it was defined relative to the cohort and exposure(s) of interest in the analysis, refer to the analysis webpage here: https://sentinelinitiative.org/studies/drugs/individual-drug-analyses/use-combined-hormonal-contraceptives-or-progestin-only</p>
Outcome	Venous thromboembolism
Algorithm to Define Outcome	The venous thromboembolism (VTE) outcome is defined as either ICD-9-CM or ICD-10-CM diagnosis codes for pulmonary embolism (PE) or deep vein thrombosis (DVT) that is the primary diagnosis from an inpatient (IP) hospital encounter or emergency department (ED) visit (including ED visits that result in admission), OR ICD-9-CM or ICD-10- CM diagnosis codes for DVT recorded during an ambulatory (AV) or other outpatient (OA) encounter AND evidence of dispensing of an anticoagulant or thrombolytic (e.g., alteplase) within 30 days of the diagnosis (excluding heparin, as it is typically used only in inpatient settings).
Query Period	January 1, 2012 - August 31, 2025
Request Send Date	January 26, 2026

Glossary

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)

Outcome - outcome of interest (either primary or secondary)

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

Request Send Date - date the request was sent to Sentinel Data Partners

Code List 1. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) Codes Used to Define Venous Thromboembolism in this Request

Code	Description	Code Category	Code Type
Venous Thromboembolism (VTE)			
41511	Iatrogenic pulmonary embolism and infarction	Diagnosis	ICD-9-CM
41519	Other pulmonary embolism and infarction	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
45184	Phlebitis and thrombophlebitis of upper extremities, unspecified	Diagnosis	ICD-9-CM
45189	Phlebitis and thrombophlebitis of other sites	Diagnosis	ICD-9-CM
4531	Thrombophlebitis migrans	Diagnosis	ICD-9-CM
4532	Other venous embolism and thrombosis of inferior vena cava	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
45381	Acute venous embolism and thrombosis of superficial veins of upper extremity	Diagnosis	ICD-9-CM
45382	Acute venous embolism and thrombosis of deep veins of upper extremity	Diagnosis	ICD-9-CM
45383	Acute venous embolism and thrombosis of upper extremity, unspecified	Diagnosis	ICD-9-CM
45384	Acute venous embolism and thrombosis of axillary veins	Diagnosis	ICD-9-CM
45385	Acute venous embolism and thrombosis of subclavian veins	Diagnosis	ICD-9-CM
45386	Acute venous embolism and thrombosis of internal jugular veins	Diagnosis	ICD-9-CM
45387	Acute venous embolism and thrombosis of other thoracic veins	Diagnosis	ICD-9-CM
45389	Acute venous embolism and thrombosis of other specified veins	Diagnosis	ICD-9-CM
4539	Other venous embolism and thrombosis of unspecified site	Diagnosis	ICD-9-CM
I2699	Other pulmonary embolism without acute cor pulmonale	Diagnosis	ICD-10-CM
I8010	Phlebitis and thrombophlebitis of unspecified femoral vein	Diagnosis	ICD-10-CM
I8011	Phlebitis and thrombophlebitis of right femoral vein	Diagnosis	ICD-10-CM
I8012	Phlebitis and thrombophlebitis of left femoral vein	Diagnosis	ICD-10-CM
I8013	Phlebitis and thrombophlebitis of bilateral femoral veins	Diagnosis	ICD-10-CM
I80201	Phlebitis and thrombophlebitis of unspecified deep vessels of right lower extremity	Diagnosis	ICD-10-CM
I80202	Phlebitis and thrombophlebitis of unspecified deep vessels of left lower extremity	Diagnosis	ICD-10-CM
I80203	Phlebitis and thrombophlebitis of unspecified deep vessels of bilateral lower extremities	Diagnosis	ICD-10-CM
I80209	Phlebitis and thrombophlebitis of unspecified deep vessels of unspecified lower extremity	Diagnosis	ICD-10-CM
I80211	Phlebitis and thrombophlebitis of right iliac vein	Diagnosis	ICD-10-CM
I80212	Phlebitis and thrombophlebitis of left iliac vein	Diagnosis	ICD-10-CM
I80213	Phlebitis and thrombophlebitis of bilateral iliac veins	Diagnosis	ICD-10-CM

Code List 1. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) Codes Used to Define Venous Thromboembolism in this Request

Code	Description	Code Category	Code Type
I80219	Phlebitis and thrombophlebitis of unspecified iliac vein	Diagnosis	ICD-10-CM
I80221	Phlebitis and thrombophlebitis of right popliteal vein	Diagnosis	ICD-10-CM
I80222	Phlebitis and thrombophlebitis of left popliteal vein	Diagnosis	ICD-10-CM
I80223	Phlebitis and thrombophlebitis of bilateral popliteal veins	Diagnosis	ICD-10-CM
I80229	Phlebitis and thrombophlebitis of unspecified popliteal vein	Diagnosis	ICD-10-CM
I80231	Phlebitis and thrombophlebitis of right tibial vein	Diagnosis	ICD-10-CM
I80232	Phlebitis and thrombophlebitis of left tibial vein	Diagnosis	ICD-10-CM
I80233	Phlebitis and thrombophlebitis of bilateral tibial veins	Diagnosis	ICD-10-CM
I80239	Phlebitis and thrombophlebitis of unspecified tibial vein	Diagnosis	ICD-10-CM
I80291	Phlebitis and thrombophlebitis of other deep vessels of right lower extremity	Diagnosis	ICD-10-CM
I80292	Phlebitis and thrombophlebitis of other deep vessels of left lower extremity	Diagnosis	ICD-10-CM
I80293	Phlebitis and thrombophlebitis of other deep vessels of bilateral lower extremities	Diagnosis	ICD-10-CM
I80299	Phlebitis and thrombophlebitis of other deep vessels of unspecified lower extremity	Diagnosis	ICD-10-CM
I803	Phlebitis and thrombophlebitis of lower extremities, unspecified	Diagnosis	ICD-10-CM
I82210	Acute embolism and thrombosis of superior vena cava	Diagnosis	ICD-10-CM
I82211	Chronic embolism and thrombosis of superior vena cava	Diagnosis	ICD-10-CM
I82220	Acute embolism and thrombosis of inferior vena cava	Diagnosis	ICD-10-CM
I82221	Chronic embolism and thrombosis of inferior vena cava	Diagnosis	ICD-10-CM
I82290	Acute embolism and thrombosis of other thoracic veins	Diagnosis	ICD-10-CM
I82291	Chronic embolism and thrombosis of other thoracic veins	Diagnosis	ICD-10-CM
I82811	Embolism and thrombosis of superficial veins of right lower extremities	Diagnosis	ICD-10-CM
I82812	Embolism and thrombosis of superficial veins of left lower extremities	Diagnosis	ICD-10-CM
I82813	Embolism and thrombosis of superficial veins of bilateral lower extremities	Diagnosis	ICD-10-CM
I82819	Embolism and thrombosis of superficial veins of unspecified lower extremities	Diagnosis	ICD-10-CM
I82890	Acute embolism and thrombosis of other specified veins	Diagnosis	ICD-10-CM
I82891	Chronic embolism and thrombosis of other specified veins	Diagnosis	ICD-10-CM
I8290	Acute embolism and thrombosis of unspecified vein	Diagnosis	ICD-10-CM
I8291	Chronic embolism and thrombosis of unspecified vein	Diagnosis	ICD-10-CM

Code List 2. List of Generic and Brand Names of Medical Products Used to Define Venous Thromboembolism in this Request

Generic Name	Brand Name
Anticoagulant	
apixaban	Eliquis
apixaban	Eliquis DVT-PE Treat 30D Start
argatroban	argatroban
argatroban in 0.9 % sodium chloride	argatroban in 0.9 % sod chlor
argatroban in sodium chloride, iso-osmotic	argatroban in NaCL (iso-os)
betrixaban maleate	Bevyxxa
bivalirudin	Angiomax
bivalirudin	bivalirudin
bivalirudin in 0.9 % sodium chloride	bivalirudin-0.9 % sodium chlor
dabigatran etexilate mesylate	Pradaxa
dabigatran etexilate mesylate	dabigatran etexilate
dalteparin sodium,porcine	Fragmin
desirudin	Iprivask
edoxaban tosylate	Savaysa
enoxaparin sodium	Enoxiluv
enoxaparin sodium	Lovenox
enoxaparin sodium	enoxaparin
fondaparinux sodium	Arixtra
fondaparinux sodium	fondaparinux
lepirudin,recombinant	Refludan
rivaroxaban	Xarelto
rivaroxaban	Xarelto DVT-PE Treat 30d Start
tinzaparin sodium,porcine	Innohep
warfarin sodium	Coumadin
warfarin sodium	Jantoven
warfarin sodium	warfarin
Thrombolytic (e.g., alteplase)	
alteplase	Activase
alteplase	Cathflo Activase
defibrotide sodium	Defitelio
reteplase	Retavase
tenecteplase	TNKase

Code List 3. List of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) Codes Used to Define Venous Thromboembolism Incidence Criteria in this Request

Code	Description	Code Category	Code Type
Venous Thromboembolism (VTE)			
41511	Iatrogenic pulmonary embolism and infarction	Diagnosis	ICD-9-CM
41519	Other pulmonary embolism and infarction	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
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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
45184	Phlebitis and thrombophlebitis of upper extremities, unspecified	Diagnosis	ICD-9-CM
45189	Phlebitis and thrombophlebitis of other sites	Diagnosis	ICD-9-CM
4531	Thrombophlebitis migrans	Diagnosis	ICD-9-CM
4532	Other venous embolism and thrombosis of inferior vena cava	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
45381	Acute venous embolism and thrombosis of superficial veins of upper extremity	Diagnosis	ICD-9-CM
45382	Acute venous embolism and thrombosis of deep veins of upper extremity	Diagnosis	ICD-9-CM
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45384	Acute venous embolism and thrombosis of axillary veins	Diagnosis	ICD-9-CM
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45386	Acute venous embolism and thrombosis of internal jugular veins	Diagnosis	ICD-9-CM
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I80209	Phlebitis and thrombophlebitis of unspecified deep vessels of unspecified lower extremity	Diagnosis	ICD-10-CM
I80211	Phlebitis and thrombophlebitis of right iliac vein	Diagnosis	ICD-10-CM

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Code	Description	Code Category	Code Type
I80212	Phlebitis and thrombophlebitis of left iliac vein	Diagnosis	ICD-10-CM
I80213	Phlebitis and thrombophlebitis of bilateral iliac veins	Diagnosis	ICD-10-CM
I80219	Phlebitis and thrombophlebitis of unspecified iliac vein	Diagnosis	ICD-10-CM
I80221	Phlebitis and thrombophlebitis of right popliteal vein	Diagnosis	ICD-10-CM
I80222	Phlebitis and thrombophlebitis of left popliteal vein	Diagnosis	ICD-10-CM
I80223	Phlebitis and thrombophlebitis of bilateral popliteal veins	Diagnosis	ICD-10-CM
I80229	Phlebitis and thrombophlebitis of unspecified popliteal vein	Diagnosis	ICD-10-CM
I80231	Phlebitis and thrombophlebitis of right tibial vein	Diagnosis	ICD-10-CM
I80232	Phlebitis and thrombophlebitis of left tibial vein	Diagnosis	ICD-10-CM
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I82890	Acute embolism and thrombosis of other specified veins	Diagnosis	ICD-10-CM
I82891	Chronic embolism and thrombosis of other specified veins	Diagnosis	ICD-10-CM
I8290	Acute embolism and thrombosis of unspecified vein	Diagnosis	ICD-10-CM
I8291	Chronic embolism and thrombosis of unspecified vein	Diagnosis	ICD-10-CM
Personal History of VTE			
V1251	Personal history of venous thrombosis and embolism	Diagnosis	ICD-9-CM
Z8671	Personal history of venous thrombosis and embolism	Diagnosis	ICD-10-CM
Z86711	Personal history of pulmonary embolism	Diagnosis	ICD-10-CM
Z86718	Personal history of other venous thrombosis and embolism	Diagnosis	ICD-10-CM

Code List 4. List of Generic and Brand Names of Medical Products Used to Define Venous Thromboembolism Incidence Criteria in this Request

Generic Name	Brand Name
Anticoagulant	
apixaban	Eliquis
apixaban	Eliquis DVT-PE Treat 30D Start
argatroban	argatroban
argatroban in 0.9 % sodium chloride	argatroban in 0.9 % sod chlor
argatroban in sodium chloride, iso-osmotic	argatroban in NaCL (iso-os)
betrixaban maleate	Bevyxxa
bivalirudin	Angiomax
bivalirudin	bivalirudin
bivalirudin in 0.9 % sodium chloride	bivalirudin-0.9 % sodium chlor
dabigatran etexilate mesylate	Pradaxa
dabigatran etexilate mesylate	dabigatran etexilate
dalteparin sodium,porcine	Fragmin
desirudin	Iprivask
edoxaban tosylate	Savaysa
enoxaparin sodium	Enoxiluv
enoxaparin sodium	Lovenox
enoxaparin sodium	enoxaparin
fondaparinux sodium	Arixtra
fondaparinux sodium	fondaparinux
lepirudin, recombinant	Refludan
rivaroxaban	Xarelto
rivaroxaban	Xarelto DVT-PE Treat 30d Start
tinzaparin sodium,porcine	Innohep
warfarin sodium	Coumadin
warfarin sodium	Jantoven
warfarin sodium	warfarin
Thrombolytic (e.g., alteplase)	
alteplase	Activase
alteplase	Cathflo Activase
defibrotide sodium	Defitelio
reteplase	Retavase
tenecteplase	TNKase