SUPPLEMENTAL MATERIAL
SUPPLEMENTAL METHODS

Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications Software (CCS) for ICD-9-CM

The Clinical Classification Software (CCS) is a tool developed by the Agency for Healthcare Research and Quality that clusters patient diagnoses and procedures into a limited number of meaningful clinical categories. The CCS collapses *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM) billing codes, which contain more than 14,000 diagnosis codes and 3,900 procedure codes, with the purpose of offering researchers the ability to use categorized conditions and procedures without having to sort through the thousands of ICD-9-CM codes. Without the CCS tool, the large number of ICD-9-CM codes would make statistical analysis and reporting difficult and time-consuming.

CCS consists of 2 related classification systems: 1) single-level and 2) multi-level. For this analysis, the single-level classification system of diagnoses was used to determine reasons for 30-day readmission, which is the most useful for ranking of diagnoses. CCS provides a listing of the ICD-9-CM codes included in each CCS diagnosis category, which can be found here: https://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp#download. The single-level CCS aggregates illnesses and conditions into 285 mutually exclusive categories. Examples of single-level CCS diagnosis categories are as follows:

- 98. Essential hypertension
- 99. Hypertension with complications and secondary hypertension
- 100. Acute myocardial infarction
- 101. Coronary atherosclerosis and other heart disease

For this analysis, we used CCS diagnosis categories 103 (Pulmonary heart disease) and 118 (Phlebitis; thrombophlebitis and thromboembolism) to identify patients with recurrent VTE or with disease processes directly related to or consequential of acute VTE.

The CCS diagnosis category “Pulmonary heart disease” consisted of the following ICD-9-CM codes: 415.0, 415.1, 415.12, 415.13, 415.19, 416.0, 416.1, 416.2, 416.8, 416.9, 417.0, 417.1, 417.8, 417.9, V12.55

The CCS diagnosis category “Phlebitis; thrombophlebitis and thromboembolism” consisted of the following ICD-9-CM codes: 451.0, 451.11, 451.19, 451.2, 451.81, 451.82, 451.83, 451.84, 451.89, 451.9, 452, 453.0, 453.1, 453.2, 453.3, 453.40, 453.41, 453.42, 453.50, 453.51, 453.52, 453.6, 453.71, 453.72, 453.73, 453.74, 453.75, 453.76, 453.77, 453.79, 453.8, 453.81, 453.82, 453.83, 453.84, 453.85, 453.86, 453.87, 453.89, 453.9, V12.51, V12.52
| ICD-9-CM Diagnosis Codes for Acute Venous Thromboembolism |
|----------------------------------------------------------|
| Acute deep vein thrombosis                               | 451.11, 451.19, 451.2, 451.81, 451.83, 451.84, 451.89, 451.9, 453.2, 453.3, 453.40, 453.41, 453.42, 453.82, 453.83, 453.84, 453.85, 453.86, 453.87, 453.89, 453.9, 671.30, 671.31, 671.33, 671.40, 671.42, 671.44 |
| Phlebitis/thrombophlebitis                               | 451.11, 451.19, 451.2, 451.81, 451.83, 451.84, 451.89, 451.9 |
| Varicose veins                                            | 454.0, 454.1, 454.2, 454.8, 454.9, 671.00, 671.01, 671.02, 671.03, 671.04 |
| Surgically-related                                       | Any surgical or post-operative code with any code for acute deep vein thrombosis |
| Pregnancy-related                                        | 671.30, 671.31, 671.33, 671.40, 671.42, 671.44; or code V22.2 (pregnant state) with any code for acute deep vein thrombosis |
| Malignancy-related                                       | Any code for malignancy with any code for acute deep vein thrombosis |
| Hypercoagulable-related                                  | 289.81 with any code for acute deep vein thrombosis |
| Trauma-related                                           | Any code for trauma with any code for acute deep vein thrombosis |
| Acute pulmonary embolism                                 | 415.11, 415.13, 415.19, 673.20, 673.21, 673.22, 673.23, 673.24, 673.80, 673.81, 673.82, 673.83, 673.84 |
| Saddle pulmonary embolism                                | 415.13 |
| Acute cor pulmonale                                      | 415.0 with any code for acute pulmonary embolism |
| Surgically-related                                       | 415.11; or any surgical or post-operative code with any code for acute pulmonary embolism |
| Pregnancy-related                                        | 673.20, 673.21, 673.22, 673.23, 673.24, 673.80, 673.81, 673.82, 673.83, 673.84; or code V22.2 (pregnant state) with any code for acute pulmonary embolism |
| Malignancy-related                                       | Any code for malignancy with any code for acute pulmonary embolism |
| Hypercoagulable-related | 289.81 with any code for acute pulmonary embolism |
|-------------------------|-----------------------------------------------|
| Trauma-related          | Any code for trauma with any code for acute pulmonary embolism |
|                         | Diagnostic Codes: 415.11                      |
|                         | Procedure Codes: 00.3, 00.7, 00.8, 00.91-00.93, 01, 02, 03.0, 03.1, 03.4-03.7, 03.97-03.99, 04.0, 04.2, 04.41, 04.42, 04.5-04.7, 06.12, 06.2-06.9, 07.0, 07.12, 07.2-07.9, 16.0, 16.3-16.7, 16.99, 17.1-17.4, 25.2-25.4, 30, 31.2, 31.3, 31.45, 31.5-31.7, 31.91, 31.92, 31.95, 31.98, 31.99, 32, 33.0, 33.1, 33.25, 33.3-33.6, 33.9, 34.0, 34.1, 34.26, 34.3-34.6, 34.72-34.74, 34.79, 34.8, 34.99, 35, 36.03, 36.1-36.9, 37.1, 37.3-37.6, 37.91, 37.99, 38.1, 38.3, 38.4, 38.6, 39.0-39.2, 39.4-39.7, 40.4-40.9, 41.0-41.2, 41.43, 41.5, 41.93, 41.94, 41.99, 42.0, 42.1, 42.3-42.9, 43, 44.2-44.6, 44.95-44.99, 45.0, 45.15, 45.26, 45.5-45.9, 46, 47, 48.0, 48.1, 48.25, 48.4-48.7, 48.92-48.99, 49.5, 49.6, 49.74-49.79, 49.95, 49.99, 50.0, 50.12, 50.3-50.6, 50.99, 51.0, 51.13, 51.2-51.7, 51.91-51.94, 51.99, 52.12, 52.5-52.8, 52.95, 52.96, 52.99, 53, 54.1-54.7, 54.92-54.96, 54.99, 55.3-55.9, 56, 57.34, 57.5-57.8, 57.91-57.93, 57.99, 58.3-58.9, 59.0-59.7, 59.91, 59.92, 59.99, 60.12, 60.14, 60.2-60.6, 60.73, 60.79, 60.93, 60.94, 60.99, 61.2-61.4, 61.92, 61.99, 62.2-62.7, 62.99, 63.4, 63.5, 63.8, 63.9, 64.3, 64.43-64.49, 64.5, 64.94-64.99, 65.0, 65.13, 65.2-65.9, 66.2-66.7, 66.99, 67.4, 67.5, 68.13, 68.14, 68.3-68.9, 69.2-69.4, 69.98, 69.99, 70.4, 70.6-70.8, 76.3-76.6, 76.91, 76.92, 77.2, 77.3, 77.7-77.9, 78.0-78.7, 80.0, 80.1, 80.4-80.7, 80.9, 81.0-81.8, 81.96, 81.97, 81.99, 82.5-82.8, 82.99, 83.1, 83.3-83.8, 83.99, 84.0-84.3, 84.40, 84.44, 84.48, 84.53, 84.54, 84.6-84.9, 85.2-85.4, 85.50, 85.53-85.55, 85.6-85.8, 85.93-85.99, 86.60-86.63, 86.65, 86.66, 86.69, 86.7-86.9 |
| Recent surgery          |                                               |
| Hypercoagulable         | 289.81                                       |
| Pregnancy               | V22.2, 673.20, 673.21, 673.22, 673.23, 673.24, 673.80, 673.81, 673.82, 673.83, 673.84, 671.30, 671.31, 671.33, 671.40, 671.42, 671.44 |
| Malignancy                      | V10; 140-209; 230-239 |
|-------------------------------|-----------------------|
| Recent trauma                 | 800-829, 850-897, 925-929, 952, 958-959 |
| Prior or current tobacco use  | 305.1, 649.00–649.04, V15.82 |

**ICD-9-CM Procedure Codes**

| Procedure                        | Code    |
|----------------------------------|---------|
| Systemic thrombolysis            | 99.10   |
| Pulmonary endarterectomy         | 38.15   |
| Extracorporeal circulation       | 39.65, 39.66 |
| Mechanical ventilation           | 96.04, 96.05, 96.70, 96.71, 96.72 |
| Inferior vena cava filter placement | 38.7 |

**ICD-9-CM Diagnosis Codes for In-hospital Adverse Events**

| Code                                |
|-------------------------------------|
| Major bleed                         |
| Gastrointestinal bleeding event     | 456.0, 456.20, 530.82, 531.0x, 531.2x, 531.4x, 531.6x, 532.0x, 532.2x, 532.4x, 532.6x, 533.0x, 533.2x, 533.4x, 533.6x, 534.0x, 534.2x, 534.4x, 534.6x, 535.01, 535.11, 535.21, 535.31, 535.41, 535.51, 535.61, 537.83, 562.02, 562.03, 562.12, 562.13, 568.81, 569.3, 569.85, 578.x |
| Procedure Code: 44.43              |
| Intracranial hemorrhage            | 430, 431, 432.0, 432.1, 432.9, 852.0x, 852.2x, 852.4x, 853.0x, |
| Other bleeding events (including red blood cell transfusion) | 285.1, 360.43, 362.43, 362.81, 363.61, 363.62, 363.72, 364.41, 372.72, 374.81, 376.32, 377.42, 379.23, 423.0x, 596.7x, 599.7x, 602.1x, 620.1, 621.4, 626.2, 626.5, 626.7, 626.8, 626.9, 719.1x, 782.7, 784.7, 784.8, 786.3x, 958.2, 997.02, 998.11 |
| Procedure codes: 99.00, 99.01, 99.02, 99.03, 99.04 |
| Cardiorespiratory arrest           | 799.1, 427.5 |
| Acute myocardial infarction/unstable angina | 410.x1, 411.1 |
| Condition              | ICD Codes                      |
|------------------------|--------------------------------|
| Cardiogenic shock      | 785.51                         |
| Acute heart failure    | 428.0, 428.1, 428.20, 428.21, 428.23, 428.30, 428.31, 428.33, 428.40, 428.41, 428.43, 428.9 |
Table S2. Candidate Variables for 30-day Readmission Prediction Models.

| Variables                                                                 |
|---------------------------------------------------------------------------|
| Age ≥median                                                              |
| Female                                                                   |
| Primary insurance                                                        |
| Medicare (vs private)                                                    |
| Medicaid (vs private)                                                    |
| Self-pay (vs private)                                                    |
| Patient household income by residential zip code ≥median                 |
| Patient residence in large (≥1 million people) metropolitan counties      |
| (versus counties of <1 million people)                                   |
| Number of chronic conditions ≥ mean                                       |
| History of hypercoagulability                                            |
| Recent surgery                                                           |
| Recent trauma                                                            |
| Pregnancy                                                                |
| Obesity                                                                  |
| Current or prior tobacco use                                             |
| Hypertension                                                             |
| Congestive heart failure                                                 |
| Valvular heart disease                                                  |
| Diabetes mellitus                                                        |
| Chronic pulmonary disease                                                |
| Pulmonary circulation disorders                                          |
| Renal disease                                                            |
| Liver disease                                                            |
| Coagulopathy                                                             |
| Chronic anemia                                                           |
| Fluid and electrolyte disorders                                          |
| Neurologic disorders/paralysis                                           |
| **Variables**                      |
|-----------------------------------|
| Malignancy                        |
| Rheumatoid arthritis/collagen vascular disease |
| Unintentional weight loss         |
| Psychoses                         |
| Depression                        |
| Alcohol abuse                     |
| Illicit drug abuse                |
| Venous thromboembolism            |
| Deep vein thrombosis              |
| Pulmonary embolus                 |
| Both                              |
| Saddle pulmonary embolism         |
| Acute cor pulmonale               |
| Phlebitis/thrombophlebitis        |
| Length of stay ≥5 days (vs <5 days) |
| Disposition at discharge          |
| Transfer to subacute nursing or intermediate care facility (vs home, no assistance) |
| Home with home health care (vs home, no assistance) |
| Non-elective index hospitalization (vs elective) |
| Large bed size of hospital (vs small/medium bed size) |
| Government or non-profit hospital (vs for-profit hospital) |
| Teaching hospital (vs non-teaching) |
| Systemic thrombolysis             |
| Mechanical ventilation            |
| Blood transfusion                 |
| Inferior vena cava filter placement |
| Major bleed                       |
| Acute myocardial infarction/unstable angina |
| Cardiogenic shock                 |
| Variables          |
|-------------------|
| Cardiorespiratory arrest |
| Acute heart failure |
Table S3. Candidate Variables for 30-Day Risk Standardization Readmissions Model.

| Variables                                      |
|------------------------------------------------|
| Age ≥median                                    |
| Female                                         |
| History of hypercoagulability                  |
| Recent surgery                                 |
| Recent trauma                                  |
| Pregnancy                                      |
| Obesity                                        |
| Current or prior tobacco use                   |
| Hypertension                                   |
| Congestive heart failure                       |
| Valvular heart disease                         |
| Diabetes mellitus                              |
| Chronic pulmonary disease                      |
| Pulmonary circulation disorders                 |
| Renal disease                                  |
| Liver disease                                  |
| Coagulopathy                                   |
| Chronic anemia                                 |
| Fluid and electrolyte disorders                |
| Neurologic disorders/paralysis                 |
| Malignancy                                     |
| Rheumatoid arthritis/collagen vascular disease |
| Unintentional weight loss                      |
| Psychoses                                      |
| Depression                                     |
| Alcohol abuse                                  |
| Illicit drug abuse                             |
Table S4. 30-Day Readmission Logistic Regression Model.

| Variable                                      | Estimate | Standard Error | Odds Ratio | 95% Confidence Interval |
|-----------------------------------------------|----------|----------------|------------|-------------------------|
| Intercept                                     | -2.02    | 0.03           | ---        | ---                     |
| Age                                           | -0.03    | <0.01          | 0.97       | (0.96, 0.98)            |
| Rheumatoid arthritis/collagen vascular disease| 0.17     | 0.03           | 1.19       | (1.13, 1.26)            |
| Congestive heart failure                      | 0.33     | 0.02           | 1.39       | (1.35, 1.44)            |
| Chronic pulmonary disease                     | 0.22     | 0.01           | 1.24       | (1.21, 1.28)            |
| Illicit drug abuse                            | 0.32     | 0.03           | 1.37       | (1.30, 1.45)            |
| Liver disease                                 | 0.21     | 0.03           | 1.23       | (1.16, 1.30)            |
| Fluid and electrolyte disorders               | 0.26     | 0.01           | 1.29       | (1.26, 1.32)            |
| Obesity                                       | -0.10    | 0.02           | 0.90       | (0.88, 0.93)            |
| Psychoses                                     | 0.21     | 0.02           | 1.24       | (1.18, 1.30)            |
| Renal disease                                 | 0.35     | 0.01           | 1.42       | (1.38, 1.46)            |
| Unintentional weight loss                     | 0.23     | 0.02           | 1.26       | (1.22, 1.31)            |
| Neurologic disorders/paralysis                | 0.12     | 0.02           | 1.13       | (1.10, 1.17)            |
| Anemia                                        | 0.24     | 0.01           | 1.27       | (1.24, 1.30)            |
| Diabetes mellitus                             | 0.19     | 0.01           | 1.21       | (1.18, 1.24)            |
| Malignancy                                    | 0.51     | 0.01           | 1.66       | (1.62, 1.70)            |
| Recent surgery                                | 0.06     | 0.01           | 1.06       | (1.03, 1.09)            |
| Depression                                    | 0.10     | 0.02           | 1.10       | (1.06, 1.14)            |
| Pregnancy                                     | -0.33    | 0.07           | 0.72       | (0.63, 0.83)            |
| Coagulopathy                                  | 0.07     | 0.02           | 1.07       | (1.03, 1.11)            |
| Recent trauma                                 | -0.10    | 0.03           | 0.91       | (0.86, 0.96)            |
| Female sex                                    | 0.03     | 0.01           | 1.03       | (1.01, 1.06)            |

* Between-hospital variance estimate when using the hierarchical model is 0.051 (standard error, 0.0041)
| Variable, N (%)                        | All Index Admissions (N = 501,616) | Non-elective 30-day Readmission | P value |
|----------------------------------------|------------------------------------|---------------------------------|---------|
| **Patient Characteristics at Index Hospitalization** |                                    |                                 |         |
| PE alone                               | 325,850 (65.0%)                    | 51,417 (67.2%)                  | 274,433 (64.6%) | <0.001 |
| Both PE and DVT                        | 175,766 (35.0%)                    | 25,108 (32.8%)                  | 150,658 (35.4%) | <0.001 |
| Saddle pulmonary embolism              | 10,901 (2.2%)                      | 1,095 (1.4%)                    | 9,806 (2.3%)   | <0.001 |
| Acute cor pulmonale                    | 1,816 (0.4%)                       | 238 (0.3%)                      | 1,578 (0.4%)   | 0.010  |
| **Provoking factors associated with PE present during admission** |                                    |                                 |         |
| Recent surgery                         | 73,057 (14.6%)                     | 12,713 (16.6%)                  | 60,344 (14.2%) | <0.001 |
| Malignancy                             | 96,642 (19.3%)                     | 22,100 (28.9%)                  | 74,542 (17.5%) | <0.001 |
| Recent trauma                          | 19,202 (3.8%)                      | 2,940 (3.8%)                    | 16,262 (3.8%)  | 0.828  |
| Hypercoagulability                     | 18,733 (3.7%)                      | 2,719 (3.6%)                    | 16,014 (3.8%)  | 0.004  |
| Pregnancy                              | 4,893 (1.0%)                       | 526 (0.7%)                      | 4,367 (1.0%)   | <0.001 |
| Age, years (mean±SD)                   | 63.1 ± 17.0                        | 64.2 ± 16.5                     | 62.9 ± 17.1    | <0.001 |
| Female                                 | 266,698 (53.2%)                    | 41,398 (54.1%)                  | 225,300 (53.0%) | <0.001 |
| **Primary insurance**                  |                                    |                                 |         |
| Medicare                               | 266,598 (53.3%)                    | 44,896 (58.8%)                  | 22,1702 (52.3%) | <0.001 |
| Medicaid                               | 51,330 (10.3%)                     | 10,625 (13.9%)                  | 40,705 (9.6%)  | <0.001 |
| Private                                | 142,064 (28.4%)                    | 15,727 (20.6%)                  | 126,337 (29.8%) | <0.001 |
| Self-pay                               | 19,818 (4.0%)                      | 2,544 (3.3%)                    | 17,274 (4.1%)  | <0.001 |
| Other                                  | 20,687 (4.1%)                      | 2,591 (3.4%)                    | 18,096 (4.3%)  | <0.001 |
| **Median household income by residential zip code** |                                    |                                 |         |
| Lowest quartile                        | 134,267 (27.2%)                    | 22,323 (29.6%)                  | 111,944 (26.8%) | <0.001 |
| Middle lowest quartile                 | 121,159 (24.5%)                    | 18,434 (24.5%)                  | 102,725 (24.6%) | 0.533  |
| Middle highest quartile                | 121,627 (24.6%)                    | 17,938 (23.8%)                  | 103,689 (24.8%) | <0.001 |
| Highest quartile                       | 116,596 (23.6%)                    | 16,688 (22.1%)                  | 99,908 (23.9%)  | <0.001 |
| Variable, N (%) | All Index Admissions (N = 501,616) | Non-elective 30-day Readmission | P value |
|-----------------|------------------------------------|---------------------------------|---------|
| Residence by county location |                                    |                                 | <0.001  |
| Central counties in metro areas with population ≥1 million | 148,701 (29.7%) | 25,409 (33.3%) | 123,292 (29.0%) | <0.001  |
| Fringe counties in metro areas with population ≥1 million | 126,680 (25.3%) | 19,600 (25.7%) | 107,080 (25.2%) | 0.009   |
| Counties in metro areas with population 250,000-999,999 | 106,961 (21.3%) | 15,268 (20.0%) | 91,693 (21.6%) | <0.001  |
| Counties in metro areas with population 50,000-249,999 | 47,628 (9.5%) | 6,727 (8.8%) | 40,901 (9.6%) | <0.001  |
| Micropolitan counties | 42,854 (8.6%) | 5,782 (7.6%) | 37,072 (8.7%) | <0.001  |
| Other | 28,286 (5.6%) | 3,614 (4.7%) | 24,672 (5.8%) | <0.001  |
| No. of chronic conditions (mean±SD) | 5.4 ± 3.1 | 6.3 ± 3.1 | 5.2 ± 3.0 | <0.001  |
| Varicose veins | 2,362 (0.5%) | 224 (0.3%) | 2,138 (0.5%) | <0.001  |
| Obesity | 94,621 (18.9%) | 13,174 (17.2%) | 81,447 (19.2%) | <0.001  |
| Current or prior tobacco use | 139,414 (27.8%) | 22,505 (29.4%) | 116,909 (27.5%) | <0.001  |
| Hypertension | 286,604 (57.1%) | 45,603 (59.6%) | 241,001 (56.7%) | <0.001  |
| Congestive heart failure | 64,153 (12.8%) | 14,026 (18.3%) | 50,127 (11.8%) | <0.001  |
| Diabetes mellitus | 112,167 (22.4%) | 20,582 (26.9%) | 91,585 (21.5%) | <0.001  |
| Chronic pulmonary disease | 122,081 (24.3%) | 23,368 (30.5%) | 98,713 (23.2%) | <0.001  |
| Pulmonary circulation disorders | 198,471 (39.6%) | 35,510 (46.4%) | 162,961 (38.3%) | <0.001  |
| Renal disease | 55,215 (11.0%) | 11,391 (14.9%) | 43,824 (10.3%) | <0.001  |
| Liver disease | 12,387 (2.5%) | 2,489 (3.3%) | 9,898 (2.3%) | <0.001  |
| Coagulopathy | 37,653 (7.5%) | 6,993 (9.1%) | 30,660 (7.2%) | <0.001  |
| Anemia | 116,733 (23.3%) | 23,208 (30.3%) | 93,525 (22.0%) | <0.001  |
| Fluid and electrolyte disorders | 131,145 (26.1%) | 25,908 (33.9%) | 105,237 (24.8%) | <0.001  |
| Neurologic disorders/paralysis | 53,581 (10.7%) | 9,803 (12.8%) | 43,778 (10.3%) | <0.001  |
| Alcohol abuse | 17,825 (3.6%) | 3,286 (4.3%) | 14,539 (3.4%) | <0.001  |
| Variable, N (%) | All Index Admissions (N = 501,616) | Non-elective 30-day Readmission | P value |
|-----------------|-----------------------------------|---------------------------------|---------|
|                 | Yes (N = 76,525)                  | No (N = 425,091)                |         |
| Illicit drug abuse | 13,822 (2.8%)                     | 3,074 (4.0%)                   | 10,748 (2.5%) | <0.001 |

For most variables, 0 to 2.5% had missing values.
Abbreviations: DVT, deep vein thrombosis; PE, pulmonary embolism
Table S6. Hospitalization and Institutional Characteristics of Index Admissions associated with Acute Pulmonary Embolism, Stratified by 30-day Readmission Status.

| Variable, N (%) | All Index Admissions (N = 501,616) | Non-elective 30-day Readmission | P value |
|-----------------|-------------------------------------|----------------------------------|---------|
| **Characteristics of Index Hospitalization** | | | |
| Elective index admission | 40,837 (8.1%) | 5,088 (6.7%) | 35,749 (8.4%) | <0.001 |
| Elective readmission | 6,755 (1.3%) | --- | --- | --- |
| Length of stay, days (mean±SD) | 7.9 ± 10.5 | 9.8 ± 12.4 | 7.5 ± 10.1 | <0.001 |
| Disposition at discharge | | | | <0.001 |
| Home, no assistance | 288,496 (57.5%) | 35,217 (46.0%) | 253,279 (59.6%) | <0.001 |
| Transfer to short term hospital | 6,031 (1.2%) | 1,188 (1.6%) | 4,843 (1.1%) | <0.001 |
| Transfer to subacute nursing or intermediate care facility | 92,916 (18.5%) | 18,839 (24.6%) | 74,077 (17.4%) | <0.001 |
| Home with home health care | 110,021 (21.9%) | 20,108 (26.3%) | 89,913 (21.2%) | <0.001 |
| Against medical advice | 3,291 (0.7%) | 1,122 (1.5%) | 2,169 (0.5%) | <0.001 |
| Cost of index hospitalization (median, IQR) | $10,418.4 (6,397.9, 19,279.4) | $13,301.3 (7,937.3, 25,073.9) | $9,992.0 (6,203.6, 18,281.3) | <0.001 |
| Cost of rehospitalization (median, IQR) | --- | $9,162.6 (5,172.0, 17,429.6) | --- | --- |
| **Characteristics of Index Hospital** | | | |
| Bed size of hospital | | | <0.001 |
| Small | 56,620 (11.3%) | 7,464 (9.8%) | 49,156 (11.6%) | <0.001 |
| Medium | 127,107 (25.3%) | 18,570 (24.3%) | 108,537 (25.5%) | <0.001 |
| Large | 317,889 (63.4%) | 50,491 (66.0%) | 267,398 (62.9%) | <0.001 |
| Ownership of hospital | | | <0.001 |
| Government | 70,139 (14.0%) | 11,211 (14.7%) | 58,928 (13.9%) | <0.001 |
| Private, non-profit | 353,823 (70.5%) | 53,350 (69.7%) | 300,473 (70.7%) | <0.001 |
| Private, for-profit | 77,654 (15.5%) | 11,964 (15.6%) | 65,690 (15.5%) | 0.202 |
| Teaching status | | | <0.001 |
| Metropolitan, non-teaching | 210,983 (42.1%) | 30,397 (39.7%) | 180,586 (42.5%) | <0.001 |
| Variable, N (%) | All Index Admissions (N = 501,616) | Non-elective 30-day Readmission | P value |
|-----------------|------------------------------------|---------------------------------|---------|
| Metropolitan, teaching | 247,324 (49.3%) | Yes (N = 76,525) | 40,744 (53.2%) | No (N = 425,091) | 206,580 (48.6%) | <0.001 |
| Non-metropolitan | 43,309 (8.6%) | Yes (N = 76,525) | 5,384 (7.0%) | No (N = 425,091) | 37,925 (8.9%) | <0.001 |
| **Procedures during Index Hospitalization** | | | |
| Systemic thrombolysis | 11,693 (2.3%) | Yes (N = 76,525) | 1,357 (1.8%) | No (N = 425,091) | 10,336 (2.4%) | <0.001 |
| Pulmonary endarterectomy | 92 (0.0%) | Yes (N = 76,525) | 11 (0.0%) | No (N = 425,091) | 81 (0.0%) | 0.378 |
| Mechanical ventilation | 24,076 (4.8%) | Yes (N = 76,525) | 5,033 (6.6%) | No (N = 425,091) | 19,043 (4.5%) | <0.001 |
| Extracorporeal circulation | 141 (0.0%) | Yes (N = 76,525) | 18 (0.0%) | No (N = 425,091) | 123 (0.0%) | 0.410 |
| Inferior vena cava filter placement | 68,793 (13.7%) | Yes (N = 76,525) | 13,325 (17.4%) | No (N = 425,091) | 55,468 (13.0%) | <0.001 |
| **Adverse events during index hospitalization** | | | |
| Major bleed | 85,706 (17.1%) | Yes (N = 76,525) | 17,593 (23.0%) | No (N = 425,091) | 68,113 (16.0%) | <0.001 |
| Gastrointestinal hemorrhage | 15,759 (3.1%) | Yes (N = 76,525) | 3,645 (4.8%) | No (N = 425,091) | 12,114 (2.8%) | <0.001 |
| Intracranial hemorrhage | 4,206 (0.8%) | Yes (N = 76,525) | 807 (1.1%) | No (N = 425,091) | 3,399 (0.8%) | <0.001 |
| Other bleeding event (including RBC transfusion) | 76,010 (15.2%) | Yes (N = 76,525) | 15,571 (20.3%) | No (N = 425,091) | 60,439 (14.2%) | <0.001 |
| Acute myocardial infarction/unstable angina | 13,483 (2.7%) | Yes (N = 76,525) | 2,480 (3.2%) | No (N = 425,091) | 11,003 (2.6%) | <0.001 |
| Cardiogenic shock | 3,204 (0.6%) | Yes (N = 76,525) | 549 (0.7%) | No (N = 425,091) | 2,655 (0.6%) | 0.003 |
| Cardiorespiratory arrest | 3,949 (0.8%) | Yes (N = 76,525) | 718 (0.9%) | No (N = 425,091) | 3,231 (0.8%) | <0.001 |
| Acute heart failure | 73,232 (14.6%) | Yes (N = 76,525) | 16,045 (21.0%) | No (N = 425,091) | 57,187 (13.5%) | <0.001 |

For most variables, 0 to 2.5% had missing values.
Abbreviations: RBC, red blood cell
Table S7. Patient Characteristics of Index Hospitalizations associated with Acute Deep Vein Thrombosis, Stratified by 30-day Readmission Status.

| Variable, N (%)                      | All Index Admissions (N = 602,126) | Non-elective 30-day Readmission | P value |
|--------------------------------------|------------------------------------|---------------------------------|---------|
|                                      |                                    | Yes (N = 117,107)               | No (N = 485,019) |         |
| Patient Characteristics at Index Hospitalization |                                    |                                 |         |
| Phlebitis/thrombophlebitis           | 53,821 (8.9%)                      | 9,262 (7.9%)                    | 44,559 (9.2%) | <0.001  |
| Provoking factors associated with deep vein thrombosis present during admission |                                    |                                 |         |
| Recent surgery                       | 140,106 (23.3%)                    | 29,741 (25.4%)                  | 110,365 (22.8%) | <0.001  |
| Malignancy                           | 120,760 (20.1%)                    | 29,465 (25.2%)                  | 91,295 (18.8%) | <0.001  |
| Recent trauma                        | 31,272 (5.2%)                      | 5,353 (4.6%)                    | 25,919 (5.3%)  | <0.001  |
| Hypercoagulability                   | 18,088 (3.0%)                      | 3,327 (2.8%)                    | 14,761 (3.0%)  | <0.001  |
| Pregnancy                            | 6,150 (1.0%)                       | 653 (0.6%)                      | 5,497 (1.1%)   | <0.001  |
| Age, years (mean±SD)                 | 64.8 ± 17.5                        | 65.1 ± 17.1                     | 64.7 ± 17.5    | <0.001  |
| Female                               | 313,934 (52.1%)                    | 61,451 (52.5%)                  | 252,483 (52.1%)| 0.010   |
| Primary insurance                    |                                    |                                 | <0.001         |         |
| Medicare                             | 361,105 (60.1%)                    | 74,867 (64.0%)                  | 286,238 (59.2%)| <0.001  |
| Medicaid                             | 70,752 (11.8%)                     | 16,719 (14.3%)                  | 54,033 (11.2%) | <0.001  |
| Private                              | 125,301 (20.9%)                    | 19,040 (16.3%)                  | 106,261 (22.0%)| <0.001  |
| Self-pay                             | 20,907 (3.5%)                      | 2,920 (2.5%)                    | 17,987 (3.7%)  | <0.001  |
| Other                                | 22,772 (3.8%)                      | 3,375 (2.9%)                    | 19,397 (4.0%)  | <0.001  |
| Median household income by residential zip code |                                    |                                 | <0.001         |         |
| Lowest quartile                      | 179,146 (30.2%)                    | 35,938 (31.1%)                  | 143,208 (30.0%)| <0.001  |
| Middle lowest quartile               | 144,110 (24.3%)                    | 27,602 (23.9%)                  | 116,508 (24.4%)| <0.001  |
| Middle highest quartile              | 138,549 (23.4%)                    | 26,575 (23.0%)                  | 111,974 (23.5%)| 0.002   |
| Highest quartile                     | 131,090 (22.1%)                    | 25,292 (21.9%)                  | 105,798 (22.2%)| 0.075   |
| Residence by county location         |                                    |                                 | <0.001         |         |
| Variable, N (%) | All Index Admissions (N = 602,126) | Non-elective 30-day Readmission | P value |
|----------------|------------------------------------|---------------------------------|---------|
|                | Yes (N = 117,107)                  | No (N = 485,019)               |         |
| Central counties in metro areas with population ≥1 million | 215,482 (35.8%) | 46,361 (39.7%) | 169,121 (34.9%) | <0.001 |
| Fringe counties in metro areas with population ≥1 million | 147,488 (24.5%) | 29,422 (25.2%) | 118,066 (24.4%) | <0.001 |
| Counties in metro areas with population 250,000-999,999 | 115,636 (19.2%) | 20,996 (18.0%) | 94,640 (19.5%) | <0.001 |
| Counties in metro areas with population 50,000-249,999 | 47,155 (7.8%) | 8,328 (7.1%) | 38,827 (8.0%) | <0.001 |
| Micropolitan counties | 43,835 (7.3%) | 7,035 (6.0%) | 36,800 (7.6%) | <0.001 |
| Other | 31,572 (5.3%) | 4,724 (4.0%) | 26,848 (5.5%) | <0.001 |
| No. of chronic conditions (mean±SD) | 5.9 ± 3.2 | 6.7 ± 3.2 | 5.7 ± 3.2 | <0.001 |
| Varicose veins | 3,588 (0.6%) | 438 (0.4%) | 3,150 (0.6%) | <0.001 |
| Obesity | 80,016 (13.3%) | 15,549 (13.3%) | 64,467 (13.3%) | 0.898 |
| Current or prior tobacco use | 130,620 (21.7%) | 25,035 (21.4%) | 105,585 (21.8%) | 0.003 |
| Hypertension | 354,237 (58.8%) | 71,280 (60.9%) | 282,957 (58.3%) | <0.001 |
| Congestive heart failure | 74,405 (12.4%) | 19,537 (16.7%) | 54,868 (11.3%) | <0.001 |
| Diabetes mellitus | 165,757 (27.5%) | 37,689 (32.2%) | 128,068 (26.4%) | <0.001 |
| Chronic pulmonary disease | 116,450 (19.3%) | 26,650 (22.8%) | 89,800 (18.5%) | <0.001 |
| Pulmonary circulation disorders | 17,811 (3.0%) | 4,389 (3.7%) | 13,422 (2.8%) | <0.001 |
| Renal disease | 122,709 (20.4%) | 31,834 (27.2%) | 90,875 (18.7%) | <0.001 |
| Liver disease | 20,269 (3.4%) | 5,321 (4.5%) | 14,948 (3.1%) | <0.001 |
| Coagulopathy | 61,945 (10.3%) | 14,537 (12.4%) | 47,408 (9.8%) | <0.001 |
| Anemia | 187,227 (31.1%) | 44,141 (37.7%) | 143,086 (29.5%) | <0.001 |
| Fluid and electrolyte disorders | 204,481 (34.0%) | 48,407 (41.3%) | 156,074 (32.2%) | <0.001 |
| Neurologic disorders/paralysis | 89,986 (14.9%) | 18,794 (16.0%) | 71,192 (14.7%) | <0.001 |
| Alcohol abuse | 23,013 (3.8%) | 4,706 (4.0%) | 18,307 (3.8%) | <0.001 |
| Illicit drug abuse | 21,880 (3.6%) | 5,263 (4.5%) | 16,617 (3.4%) | <0.001 |

For most variables, 0 to 2.5% had missing values.
Table S8. Hospitalization and Institutional Characteristics of Index Admissions associated with Acute Deep Vein Thrombosis, Stratified by 30-day Readmission Status.

| Variable, N (%) | All Index Admissions (N = 602,126) | Non-elective 30-day Readmission | P value |
|-----------------|-------------------------------------|----------------------------------|---------|
|                 |                                     | Yes (N = 117,107)                | No (N = 485,019) |       |
| Characteristics of Index Hospitalization |                          |                                 |         |
| Elective index admission                  | 76,889 (12.8%)                | 10,713 (9.2%)                    | 66,176 (13.7%) | <0.001 |
| Elective readmission                       | 12,781 (2.1%)                 | ---                             | ---       | ---    |
| Length of stay, days (mean±SD)             | 10.6 ± 14.6                    | 12.6 ± 15.9                     | 10.1 ± 14.2 | <0.001 |
| Disposition at discharge                   |                                     |                                 |           |
| Home, no assistance                         | 279,873 (46.5%)               | 44,854 (38.3%)                   | 235,019 (48.5%) | <0.001 |
| Transfer to short term hospital             | 8,483 (1.4%)                  | 17,72 (1.5%)                     | 6,711 (1.4%)  | <0.001 |
| Transfer to subacute nursing or intermediate care facility | 164,048 (27.3%) | 38,129 (32.6%)                  | 125,919 (26.0%) | <0.001 |
| Home with home health care                  | 143,166 (23.8%)               | 30,413 (26.0%)                   | 112,753 (23.3%) | <0.001 |
| Against medical advice                      | 5,413 (0.9%)                  | 1,827 (1.6%)                     | 3,586 (0.7%)  | <0.001 |
| Cost of index hospitalization (median, IQR) | $12,216.7 (5,806.2, 27,962.2) | $16,039.6 (7,898.5, 34,592.1)   | $11,373.6 (5,432.7, 26,302.2) | <0.001 |
| Cost of rehospitalization (median, IQR)     | ---                           | $10,208.2 (5.614.9, 19.717.2)   | ---        | ---    |
| Characteristics of Index Hospital           |                                     |                                 |           |
| Bed size of hospital                        |                                     |                                 |           |
| Small                                       | 55,808 (9.3%)                  | 9,569 (8.2%)                     | 46,239 (9.5%)  | <0.001 |
| Medium                                      | 140,675 (23.4%)                | 26,509 (22.6%)                   | 114,166 (23.5%) | <0.001 |
| Large                                       | 405,643 (67.4%)                | 81,029 (69.2%)                   | 324,614 (66.9%) | <0.001 |
| Ownership of hospital                       |                                     |                                 |           |
| Government                                  | 87,301 (14.5%)                 | 16,905 (14.4%)                   | 70,396 (14.5%)  | 0.493  |
| Private, non-profit                         | 415,491 (69.0%)                | 81,163 (69.3%)                   | 334,328 (68.9%) | 0.012  |
| Private, for-profit                         | 99,334 (16.5%)                 | 19,039 (16.3%)                   | 80,295 (16.6%)  | 0.013  |
| Teaching status                             |                                     |                                 |           |
| Metropolitan, non-teaching                  | 241,868 (40.2%)                | 45,633 (39.0%)                   | 196,235 (40.5%) | <0.001 |
| Variable, N (%) | All Index Admissions (N = 602,126) | Non-elective 30-day Readmission | P value |
|----------------|-------------------------------------|----------------------------------|---------|
| Metropolitan, teaching | 317,148 (52.7%) | 65,417 (55.9%) | 251,731 (51.9%) | <0.001 |
| Non-elective 30-day Readmission | 43,110 (7.2%) | 6,057 (5.2%) | 37,053 (7.6%) | <0.001 |

**Procedures during Index Hospitalization**

| Procedure | All Index Admissions (N = 602,126) | Non-elective 30-day Readmission | P value |
|-----------|-------------------------------------|----------------------------------|---------|
| Systemic thrombolysis | 18,096 (3.0%) | 2,874 (2.5%) | 15,222 (3.1%) | <0.001 |
| Inferior vena cava filter placement | 73,782 (12.3%) | 16,128 (13.8%) | 57,654 (11.9%) | <0.001 |

**Adverse events during Index Hospitalization**

| Event | All Index Admissions (N = 602,126) | Non-elective 30-day Readmission | P value |
|-------|-------------------------------------|----------------------------------|---------|
| Major bleed | 153,927 (25.6%) | 36,994 (31.6%) | 116,933 (24.1%) | <0.001 |
| Gastrointestinal hemorrhage | 31,869 (5.3%) | 7,935 (6.8%) | 23,934 (4.9%) | <0.001 |
| Intracranial hemorrhage | 11,366 (1.9%) | 2,192 (1.9%) | 9,174 (1.9%) | 0.656 |
| Other bleeding event (including RBC transfusion) | 134,861 (22.4%) | 32,867 (28.1%) | 101,994 (21.0%) | <0.001 |
| Acute myocardial infarction/unstable angina | 16,841 (2.8%) | 4,085 (3.5%) | 12,756 (2.6%) | <0.001 |
| Cardiogenic shock | 4,482 (0.7%) | 1,103 (0.9%) | 3,379 (0.7%) | <0.001 |
| Cardiorespiratory arrest | 5,107 (0.8%) | 1,207 (1.0%) | 3,900 (0.8%) | <0.001 |
| Acute heart failure | 100,914 (16.8%) | 26,283 (22.4%) | 74,631 (15.4%) | <0.001 |

For most variables, 0 to 2.5% had missing values.

Abbreviations: RBC, red blood cell
Table S9. Patient Characteristics of Index Hospitalizations associated with a Primary Diagnosis Code for Venous Thromboembolism, Stratified by 30-day Readmission Status.

| Variable, N (%)                      | All Index Admissions (N=548,413) | Non-elective 30-day Readmission | P value |
|--------------------------------------|----------------------------------|----------------------------------|---------|
|                                      | Yes (N = 72,803)                 | No (N = 475,610)                 |         |
| Patient Characteristics at Index Hospitalization |                                  |                                  |         |
| Venous thromboembolism               |                                  |                                  | <0.001  |
| Pulmonary embolism                   | 299,117 (54.5%)                  | 38,789 (53.3%)                   | 260,328 (54.7%) |
| Deep vein thrombosis                 | 249,296 (45.5%)                  | 34,014 (46.7%)                   | 215,282 (45.3%) |
| Saddle pulmonary embolus             | 9,461 (1.7%)                     | 857 (1.2%)                       | 8,604 (1.8%) |
| Acute cor pulmonale                  | 13,47 (0.2%)                     | 150 (0.2%)                       | 1,197 (0.3%) |
| Thrombophlebitis                     | 9,806 (1.8%)                     | 1,222 (1.7%)                     | 8,584 (1.8%) |
| Provoking factors associated with VTE present during admission |                                  |                                  |         |
| Recent surgery                       | 33,812 (6.2%)                    | 4,704 (6.5%)                     | 29,108 (6.1%) |
| Malignancy                           | 81,652 (14.9%)                   | 17,506 (24.0%)                   | 64,146 (13.5%) |
| Recent trauma                        | 9,120 (1.7%)                     | 1,338 (1.8%)                     | 7,782 (1.6%) |
| Hypercoagulability                   | 23,976 (4.4%)                    | 3,152 (4.3%)                     | 20,824 (4.4%) |
| Pregnancy                            | 7,131 (1.3%)                     | 741 (1.0%)                       | 6,390 (1.3%) |
| Age, years (mean±SD)                 | 63.0 ± 17.6                      | 64.6 ± 17.3                      | 62.8 ± 17.7 |
| Female                               | 294,042 (53.6%)                  | 40,443 (55.6%)                   | 253,599 (53.3%) |
| Primary insurance                    |                                  |                                  | <0.001  |
| Medicare                             | 293,251 (53.6%)                  | 43,773 (60.2%)                   | 249,478 (52.6%) |
| Medicaid                             | 55,569 (10.2%)                   | 10,051 (13.8%)                   | 45,518 (9.6%) |
| Private                              | 150,384 (27.5%)                  | 13,523 (18.6%)                   | 136,861 (28.8%) |
| Self-pay                             | 24,435 (4.5%)                    | 2,682 (3.7%)                     | 21,753 (4.6%) |
| Other                                | 23,542 (4.3%)                    | 2,636 (3.6%)                     | 20,906 (4.4%) |
| Median household income by residential zip code |                                  |                                  | <0.001  |
| Lowest quartile                      | 155,422 (28.8%)                  | 22,501 (31.4%)                   | 132,921 (28.4%) |
| Variable, N (%)                                      | All Index Admissions (N=548,413) | Non-elective 30-day Readmission | P value |
|-----------------------------------------------------|----------------------------------|---------------------------------|---------|
|                                                     | Yes (N = 72,803)                  | No (N = 475,610)                |         |
| Middle lowest quartile                              | 134,884 (25.0%)                  | 17,723 (24.7%)                  | 117,161 (25.0%) | 0.062 |
| Middle highest quartile                             | 129,862 (24.1%)                  | 16,683 (23.3%)                  | 113,179 (24.2%) | <0.001 |
| Highest quartile                                    | 119,592 (22.2%)                  | 14,820 (20.7%)                  | 104,772 (22.4%) | <0.001 |
| Residence by county location                        |                                  |                                 |         |
| Central counties in metro areas with population ≥1 million | 161,324 (29.4%)                  | 24,089 (33.2%)                  | 137,235 (28.9%) | <0.001 |
| Fringe counties in metro areas with population ≥1 million | 138,399 (25.3%)                  | 18,883 (26.0%)                  | 119,516 (25.2%) | <0.001 |
| Counties in metro areas with population 250,000-999,999 | 116,601 (21.3%)                  | 14,375 (19.8%)                  | 102,226 (21.5%) | <0.001 |
| Counties in metro areas with population 50,000-249,999 | 51,712 (9.4%)                    | 6,423 (8.8%)                    | 45,289 (9.5%) | <0.001 |
| Micropolitan counties                               | 47,555 (8.7%)                    | 5,457 (7.5%)                    | 42,098 (8.9%) | <0.001 |
| Other                                               | 32,204 (5.9%)                    | 3,438 (4.7%)                    | 28,766 (6.1%) | <0.001 |
| No. of chronic conditions (mean±SD)                 | 4.8 ± 3.0                        | 5.8 ± 3.0                       | 4.7 ± 2.9 | <0.001 |
| Varicose veins                                      | 3,797 (0.7%)                     | 326 (0.4%)                      | 3,471 (0.7%) | <0.001 |
| Obesity                                             | 94,871 (17.3%)                   | 11,694 (16.1%)                  | 83,177 (17.5%) | <0.001 |
| Current or prior tobacco use                        | 144,725 (26.4%)                  | 20,599 (28.3%)                  | 124,126 (26.1%) | <0.001 |
| Hypertension                                        | 317,524 (57.9%)                  | 44,906 (61.7%)                  | 272,618 (57.3%) | <0.001 |
| Congestive heart failure                            | 56,432 (10.3%)                   | 11,846 (16.3%)                  | 44,586 (9.4%) | <0.001 |
| Valvular heart disease                              | 25,608 (4.7%)                    | 4,180 (5.7%)                    | 21,428 (4.5%) | <0.001 |
| Diabetes mellitus                                   | 122,415 (22.3%)                  | 20,052 (27.5%)                  | 102,363 (21.5%) | <0.001 |
| Chronic pulmonary disease                           | 115,300 (21.0%)                  | 20,170 (27.7%)                  | 95,130 (20.0%) | <0.001 |
| Pulmonary circulation disorders                     | 69,033 (12.6%)                   | 8,760 (12.0%)                   | 60,273 (12.7%) | <0.001 |
| Renal disease                                       | 65,556 (12.0%)                   | 12,405 (17.0%)                  | 53,151 (11.2%) | <0.001 |
| Liver disease                                       | 12,147 (2.2%)                    | 2,329 (3.2%)                    | 9,818 (2.1%) | <0.001 |
| Coagulopathy                                        | 34,395 (6.3%)                    | 5,719 (7.9%)                    | 28,676 (6.0%) | <0.001 |
| Variable, N (%) | All Index Admissions (N=548,413) | Non-elective 30-day Readmission | P value |
|-----------------|----------------------------------|---------------------------------|---------|
|                 |                                  | Yes (N = 72,803)                | No (N = 475,610) | |
| Anemia          | 120,017 (21.9%)                  | 22,009 (30.2%)                 | 98,008 (20.6%)   | <0.001 |
| Fluid and electrolyte disorders | 101,949 (18.6%)                  | 18,568 (25.5%)                 | 83,381 (17.5%)   | <0.001 |
| Neurologic disorders/paralysis | 57,372 (10.5%)                  | 9,367 (12.9%)                  | 48,005 (10.1%)   | <0.001 |
| Alcohol abuse   | 16,608 (3.0%)                    | 2,836 (3.9%)                   | 13,772 (2.9%)    | <0.001 |
| Illicit drug abuse | 13,842 (2.5%)                   | 2,809 (3.9%)                   | 11,033 (2.3%)    | <0.001 |

For most variables, 0 to 2.5% had missing values.

Abbreviations: DVT, deep vein thrombosis; PE, pulmonary embolism; VTE, venous thromboembolism
Table S10. Hospitalization and Institutional Characteristics of Index Admissions associated with a Primary Diagnosis Code for Venous Thromboembolism, Stratified by 30-day Readmission Status.

| Variable, N (%) | All Index Admissions (N = 548,413) | Non-elective 30-day Readmission |
|----------------|-------------------------------------|--------------------------------|
|                |                                     | Yes (N =72,803) | No (N = 475,610) | P value |
| **Characteristics of Index Hospitalization** |                                     |                  |                  |
| Elective index admission | 39,151 (7.1%) | 3,516 (4.8%) | 35,635 (7.5%) | <0.001 |
| Elective readmission | 6,657 (1.2%) | --- | --- | --- |
| Length of stay, days (mean±SD) | 5.1 ± 4.9 | 6.1 ± 6.1 | 4.9 ± 4.7 | <0.001 |
| **Disposition at discharge** |                                     |                  |                  |
| Home, no assistance | 351,702 (64.2%) | 37,854 (52.0%) | 313,848 (66.0%) | <0.001 |
| Transfer to short term hospital | 3,829 (0.7%) | 734 (1.0%) | 3,095 (0.7%) | <0.001 |
| Transfer to subacute nursing or intermediate care facility | 77,374 (14.1%) | 14,634 (20.1%) | 62,740 (13.2%) | <0.001 |
| Home with home health care | 110,904 (20.2%) | 18,274 (25.1%) | 92,630 (19.5%) | <0.001 |
| Against medical advice | 4,138 (0.8%) | 1,272 (1.7%) | 2,866 (0.6%) | <0.001 |
| Cost of index hospitalization (median, IQR) | $7,495.2 (4,689.1, 12,179.7) | $9,040.3 (5,614.3, 14,750.3) | $7,292.1 (4,576.0, 11,786.1) | <0.001 |
| Cost of rehospitalization (median, IQR) | --- | $8,392.0 (4,825.3, 15,600.9) | --- | --- |
| **Characteristics of Index Hospital** |                                     |                  |                  |
| Bed size of hospital |                                     |                  |                  |
| Small | 62,522 (11.4%) | 7,263 (10.0%) | 55,259 (11.6%) | <0.001 |
| Medium | 143,702 (26.2%) | 18,649 (25.6%) | 125,053 (26.3%) | <0.001 |
| Large | 342,189 (62.4%) | 46,891 (64.4%) | 295,298 (62.1%) | <0.001 |
| Ownership of hospital |                                     |                  |                  |
| Government | 74,238 (13.5%) | 10,073 (13.8%) | 64,165 (13.5%) | 0.011 |
| Private, non-profit | 378,083 (68.9%) | 49,462 (67.9%) | 328,621 (69.1%) | <0.001 |
| Private, for-profit | 96,092 (17.5%) | 13,268 (18.2%) | 82,824 (17.4%) | <0.001 |
| Teaching status |                                     |                  |                  | <0.001 |
| Variable, N (%) | All Index Admissions (N = 548,413) | Non-elective 30-day Readmission |
|-----------------|-------------------------------------|---------------------------------|
| Metropolitan, non-teaching | 247,816 (45.2%) | Yes (N = 72,803) 32,207 (44.2%) |
| Metropolitan, teaching | 245,072 (44.7%) | No (N = 475,610) 215,609 (45.3%) | <0.001 |
| Non-metropolitan | 55,525 (10.1%) | | |

Procedures during Index Hospitalization

| Procedure | All (N = 548,413) | Yes (N = 72,803) | No (N = 475,610) | P value |
|-----------|------------------|-----------------|-----------------|---------|
| Systemic thrombolysis | 19,250 (3.5%) | 2,003 (2.8%) | 17,247 (3.6%) | <0.001 |
| Pulmonary endarterectomy | 69 (0.0%) | 8 (0.0%) | 61 (0.0%) | 0.680 |
| Mechanical ventilation | 4,673 (0.9%) | 936 (1.3%) | 3,737 (0.8%) | <0.001 |
| Extracorporeal circulation | 50 (0.0%) | 3 (0.0%) | 47 (0.0%) | 0.129 |
| Inferior vena cava filter placement | 68,088 (12.4%) | 12,034 (16.5%) | 56,054 (11.8%) | <0.001 |

Adverse events during Index Hospitalization

| Event | All (N = 548,413) | Yes (N = 72,803) | No (N = 475,610) | P value |
|-------|------------------|-----------------|-----------------|---------|
| Major bleed | 55,545 (10.1%) | 10,782 (14.8%) | 44,763 (9.4%) | <0.001 |
| Gastrointestinal hemorrhage | 9,474 (1.7%) | 2,040 (2.8%) | 7,434 (1.6%) | <0.001 |
| Intracranial hemorrhage | 1,294 (0.2%) | 273 (0.4%) | 1,021 (0.2%) | <0.001 |
| Other bleeding event (including RBC transfusion) | 49,512 (9.0%) | 9,577 (13.2%) | 39,935 (8.4%) | <0.001 |
| Acute myocardial infarction/unstable angina | 4,840 (0.9%) | 811 (1.1%) | 4,029 (0.8%) | <0.001 |
| Cardiogenic shock | 1,329 (0.2%) | 178 (0.2%) | 1,151 (0.2%) | 0.898 |
| Cardiorespiratory arrest | 1,349 (0.2%) | 210 (0.3%) | 1,139 (0.2%) | 0.012 |
| Acute heart failure | 58,629 (10.7%) | 12,377 (17.0%) | 46,252 (9.7%) | <0.001 |

For most variables, 0 to 2.5% had missing values. Abbreviations: RBC, red blood cell
Figure S1. Flow Diagram of Selection of Hospitalizations.

Flow diagram of hospitalization selection for the analysis. Hospitalization numbers are unweighted.
Figure S2. Cumulative Incidences of Readmission through 30 Days after Discharge following Hospitalizations associated with Acute Venous Thromboembolism.

| Days | No. at Risk | No. of Events | Cumulative Incidence |
|------|-------------|--------------|---------------------|
| 0    | 1,103,742   | 0            | ---                 |
| 10   | 1,007,443   | 96,299       | 0.087               |
| 20   | 949,459     | 57,984       | 0.140               |
| 30   | 910,110     | 39,349       | 0.175               |

Displayed are the cumulative incidences of readmission through 30 days post-discharge. Readmissions accrued throughout the 30-day period. CI indicates confidence interval.
Predictors of readmission within 30 days following an index hospitalization associated with acute pulmonary embolism.
Figure S4. Predictors of 30-day Readmission following Hospitalizations associated with Acute Deep Vein Thrombosis.

| Predictor                                      | Relative Risk | Odds Ratio (95% CI) |
|------------------------------------------------|---------------|---------------------|
| Malignancy                                     | *             | 1.39 (1.37, 1.41)   |
| Insurance: Medicaid (vs. Private)              | *             | 1.40 (1.37, 1.43)   |
| Insurance: Medicare (vs. Private)              | *             | 1.28 (1.26, 1.31)   |
| Insurance: Self-pay (vs. Private)              | *             | 0.96 (0.92, 0.99)   |
| Non-elective index hospitalization             | *             | 1.35 (1.33, 1.38)   |
| Acute heart failure during index hospitalization| *             | 1.21 (1.19, 1.23)   |
| Discharge to short-term facility (vs. home, no assistance) | *             | 1.21 (1.19, 1.23)   |
| Discharge to home with home care (vs. home, no assistance) | *             | 1.16 (1.14, 1.17)   |
| Renal disease                                  | *             | 1.26 (1.24, 1.28)   |
| Duration of index hospitalization ≥5 days      | *             | 1.26 (1.24, 1.28)   |
| ≥7 chronic medical conditions                  | *             | 1.18 (1.17, 1.20)   |
| Chronic pulmonary disease                      | *             | 1.10 (1.08, 1.11)   |
| Fluid and electrolyte disorder                 | *             | 1.13 (1.12, 1.15)   |
| Age (years)                                    | *             | 0.99 (0.99, 0.99)   |

Predictors of readmission within 30 days following an index hospitalization associated with acute deep vein thrombosis.
Predictors of readmission within 30 days following an index hospitalization associated with acute venous thromboembolism in which patients were discharged to home.
Figure S6. Top Causes of Non-Elective 30-Day Readmission following Hospitalizations associated with Acute Venous Thromboembolism for Patients Discharged to Home.

The figure displays the main reasons for 30-day readmission following hospitalizations associated with acute venous thromboembolism in which patients were discharged to home. The most common cause of readmission was related to malignancy, followed by procedural complications, and thrombophlebitis.
Figure S7. Predictors of 30-day Readmission following Hospitalizations associated with a Primary Diagnosis Code for Venous Thromboembolism.

Predictors of readmission within 30 days following an index hospitalization associated with a primary diagnosis code for venous thromboembolism.
Figure S8. Top Causes of Non-Elective 30-Day Readmission following Hospitalizations associated with a Primary Diagnosis Code for Venous Thromboembolism.

The figure displays the main reasons for 30-day readmission following hospitalizations associated with acute venous thromboembolism in which patients had a primary diagnosis code for venous thromboembolism. The most common cause of readmission was related to thrombophlebitis, followed by pulmonary heart disease and malignancy.
Supplemental Reference:

1. HCUP Clinical Classifications Software (CCS) for ICD-9-CM [Internet]. https://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Accessed March 31, 2017.