**SUPPLEMENTARY MATERIAL**

**Table 1: Exclusion Criteria**

|  |
| --- |
| **Proportion of Tests Excluded:** 362/2179 (16.6%) |
| **Exclusion Criteria** |
| Workup of isolated cytopenias |
| Workup of new or known autoimmune diseases (e.g. lupus, rheumatoid arthritis) |
| Workup of cutaneous lesions and rashes |
| Patients with left ventricular assist devices |
| Standard workup of undifferentiated pulmonary hypertension |
| Workup of isolated elevated prothrombin time or partial thromboplastin time |
| Workup sent solely on suspicion of possible thrombotic event without diagnostic confirmation |
| Tests ordered with no documentation or justification |

**Table 2: Thrombophilia Testing Reimbursement Rates, CMS 20166,[[1]](#footnote-1)**

|  |  |
| --- | --- |
| **Test** | **Cost (USD)** |
| Anticardiolipin IgG or IgM | $35 |
| Beta-2 glycoprotein 1 IgG/IgM | $69 |
| dRRVT | $13 |
| Lupus anticoagulant | $108 |
| Antithrombin Activity | $16 |
| Factor V Leiden | $83 |
| Prothrombin 20210 gene mutation | $67 |
| Protein C Activity | $19 |
| Protein S Activity | $21 |
| JAK2 V617F Mutation | $125 |

**Table 3: Criteria Used to Determine Appropriateness of Test Ordering[[2]](#footnote-2)**

|  |
| --- |
| **Inappropriate Ordering** |

|  |
| --- |
| **Patient characteristics** |

|  |
| --- |
| Provoked VTE occurring in the setting of major transient risk factor within 3 months (e.g. trauma, surgery, immobility) |
| Pregnancy-related VTE |
| Advanced liver disease and abnormal function |
| Ordering factor V Leiden or prothrombin 20210 gene mutation in patients who have had a liver transplant (no correlation between patient’s genotype and factor status produced by the new liver) |
| **Timing** |
| Ordering antithrombin, protein C or S activity levels during the first 3 months of anticoagulant therapy |
| Ordering protein C or S activity levels during warfarin therapy, or within 2 weeks of stopping warfarin |
| Ordering lupus anticoagulant, dRVVT, antithrombin, protein C or S activity levels in patients on direct oral anticoagulants |
| Duplicate ordering of inherited thrombophilias: factor V Leiden, prothrombin 20210 gene mutation, or JAK2 V167F mutation. |
| Ordering of inherited thrombophilia workups (factor V Leiden, prothrombin 20210 gene mutation, and protein C/S levels) in the inpatient setting, if fails to impact clinical management decisions. |
| **Appropriate Ordering** |
| Patients with unprovoked VTE in whom test results may impact duration or choice of anticoagulant (e.g. positive antiphospholipid antibody screening) |
| Patients with VTE and multiple family members with history of VTE |
| Thrombosis at unusual sites (e.g. splanchnic thrombosis, Budd-Chiari, or cerebral venous thrombosis) |
| Recurrent provoked VTE |
| Screening for antiphospholipid antibody in the setting of recurrent pregnancy loss |
| Unexplained arterial thrombosis |
| Ordering antiphospholipid antibody testing in the setting of arterial thrombosis (e.g. peripheral arterial events, CVA) |
| **Equivocal Ordering** |
| Female patients who develop VTE on hormonal therapy |
| Upper extremity DVT |
| Testing ordered at the patient’s request |
| VTE with minor risk factor (e.g. travel-related or flight < 6-8h, minor surgery, prolonged sitting, etc.) |
| VTE in young patients with stroke and patent foramen ovale |

**Table 4: Timing and Contextual Characteristics Used to Determine Appropriateness of Test Ordering[[3]](#footnote-3)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Assay** | **Acute Thrombosis** | **UFH** | **LMWH** | **Warfarin** | **DOAC** | **Within 2 weeks of stopping warfarin** |
| Factor V Leiden | √ | √ | √ | √ | √ |  |
| Prothrombin 20210 gene mutation | √ | √ | √ | √ | √ |  |
| Protein C Activity | X | X | X | X | X | X |
| Protein S Activity | X | X | X | X | X | X |
| Antithrombin | X | X | X | X | X |  |
|  |  |  |  |  |  |  |
| Lupus anticoagulant | √ | X | X | √ | X |  |
| dRVVT | √ | √ | √ | √ | X |  |
| Beta-2 glycoprotein 1 IgM/IgG | √ | √ | √ | √ | √ |  |
| Anticardiolipin IgM/IgG | √ | √ | √ | √ | √ |  |
| JAK2 V167F mutation | √ | √ | √ | √ | √ |  |

1. **CMS, Center Medicare and Medicaid Services; dRRVT, dilute Russell viper venom time; USD, United States Dollars.** [↑](#footnote-ref-1)
2. **DVT, deep venous thrombosis; VTE, venous thromboembolism; PE, pulmonary embolism; CVA, cerebrovascular accident; PVD, peripheral vascular disease; dRVVT, dilute Russell viper venom time; USD, United States Dollars.** [↑](#footnote-ref-2)
3. **dRVVT, dilute Russell viper venom time; UFH, unfractionated heparin; LMWH, low-molecular weight heparin; DOAC, direct oral anticoagulant.** [↑](#footnote-ref-3)