Making the right thing easy to do: automatic risk stratification for hospital-acquired thromboembolism

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| **Challenge** | Hospital-acquired venous thromboembolism (HA VTE) is a serious preventable complication. |
| **Existing Evidence** | Current standard of care is based on risk assessment models which require manual calculation. Existing prelim evidence suggest that these models are time-consuming, not being used in clinical practice and are also not predictive in our population. |
| **Target Population** | All medical admissions at KPNC. |
| **Intervention or Exposure** | Decision support can help physicians choose strategies to prevent HA VTE based on the patient’s risk. We hypothesized that an automatically calculated Padua risk score could improve risk-concordant HA VTE prophylaxis that will reduce unnecessary anticoagulation while increasing appropriate anticoagulation. |
| **Outcomes/Key Findings** | The current industry standard, Padua Prediction Score (AUC=60%), is not highly accurate in our setting. We developed a predictive HA VTE model (23 variables) that is superior to the current Padua score (AUC=70%).  The rate of HA VTE is 1.24%, rising over time. Current HBS-provider risk assessment is not predictive of HA VTE (AUC=51.8%).  Anticoagulant used differs across medical centers, and unfractionated heparin (considered less effective) is used 2-3 times more than enoxaparin. |
| **Resulting Action/Change** | Findings warrant changes to the HBS admission order set to include an automated HA-VTE risk score and patient-tailored recommendations for HA-VTE prophylaxis in real time. Regular meetings with key stakeholders including HBS Chiefs, hematology leadership, internal medicine residents produced a consensus approach to incorporating a HA-VTE risk model into KPHC order sets. |
| **Additional Recommendations** | The admissions order set has been adjusted to promote the use of LMWH, and standardize dosing for VTE prophylaxis Spring 2022. |
| **Implementation Tools** | A validated dynamic automated cohort of HA-VTE and a new risk assessment model for HA-VTE will serve as the basis for planned changes in the HBS admission order set to improve prediction and prevention of HA-VTE in a more guideline-consistent manner. |
| **Implementation Measurement** | FDA guidance around decision support tools that utilize artificial intelligence has recently changed and requires further steps to reach compliant implementation. |
| **Reference** | <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2798830>  Additional manuscript on practice patterns for HA-VTE prophylaxis submitted (first author James Xu). |