MSHS COVID ANTICOAGULATION PROTOCOL

The Mount Sinai Health System has developed and refined a protocol for anticoagulant therapy given the potential role for undiagnosed PE and microthrombi in the pathophysiology of the respiratory compromise commonly seen in patients with Severe Acute Respiratory Distress Syndrome Coronavirus (SARS-CoV-2) disease (COVID). Evidence that thromboembolism may play a role is seen in elevated markers of thrombosis, including high levels of D-dimers, autopsy data, and studies finding a 25-69% incidence of VTE in ICU patients. VTE management is challenging for COVID patients as radiologic studies for suspected DVT or PE are often not obtained due to the infectious risk. The MSHS protocol addresses patients based on varying degrees of acuity and risk, as outlined below.

**All admitted patients with COVID:**

- All admitted patients should be assessed for VTE risk factors, signs or symptoms of DVT and PE, severity, and bleeding risk.
- Assessment of severity is based on clinician judgment, and can entail symptoms (worsening dyspnea), signs (e.g., RR >24), oxygen requirement (e.g., ≥6L O2 NC), and biomarkers (e.g., D-dimers >1.5 or increasing).
- Increased risk for bleeding includes active bleeding, PLT <50K, or INR >1.8.

**Medicine wards, no evidence of severe respiratory compromise:**

- Patients without evidence of severe respiratory compromise should receive aggressive VTE prophylaxis:
  - BMI <40
    - CrCl >30: Enoxaparin 30 mg SQ Q12H
    - CrCl ≤30: Enoxaparin 30 mg SQ daily; Alternative - heparin 5,000 units SQ Q8hrs
  - BMI ≥40
    - CrCl >30: Enoxaparin 40 mg SQ Q12H
    - CrCl ≤30: Enoxaparin 40 mg SQ daily; Alternative - heparin 7,500 units SQ Q8hrs
- If anticoagulant prophylaxis contraindicated, apply sequential compression device (SCD) per standard MSHS VTE prophylaxis protocol. SCD should not be placed if a DVT is present or there are signs/symptoms of DVT (i.e., unilateral leg swelling and pain).

**Medicine Wards, severe respiratory compromise or worsening respiratory status, low bleeding risk:**

- Intermediate-dose anticoagulation: Enoxaparin 1mg/kg SC q 24hr
- CKD
- CrCl <30 and not on Renal Replacement Therapy (RRT: HD, PD, CVVH) – No dose change recommended.
- RRT – Avoid treatment dose enoxaparin. Consider substituting apixaban 2.5mg PO BID.
- If the index of suspicion for suspected PE is very high (e.g., signs/symptoms of DVT and/or abrupt hypoxia and chest pain) and unable to obtain an appropriate radiologic test, treatment-dose anticoagulation is recommended.

**ICU, low bleeding risk:**

- Treatment dose anticoagulation: Enoxaparin 1mg/kg SC q 12hr. Enoxaparin is preferred due to predictable action.
- CKD with CrCl <30 - IV heparin is recommended. The standard VTE treatment PTT target should be utilized. No bolus should be given to minimize the risk of bleeding.
- Consider enrolling patient in fibrinolysis trial.
- Duration – Patients transferred from the ICU to a Medicine ward should continue on treatment-dose anticoagulation for an additional 2 weeks. If still hospitalized after this interval they can transition to a prophylaxis-dose regimen as described in the “Medicine wards, no evidence of severe respiratory compromise” section.

**Confirmed VTE, based on positive diagnostic test (e.g., LE ultrasound, CTA)**

- Treatment dose anticoagulation
  - Can initiate treatment-dose apixaban or rivaroxaban to avoid need to transition from LMWH to oral agent.
    - Apixaban dose: 10mg PO BID for 7 days then 5mg PO BID.
    - Rivaroxaban dose: 15mg PO BID for 21 days then 20mg daily.
  - CrCl <30, including RRT: No adjustment to apixaban is needed. Avoid rivaroxaban if CrCl <30. IV heparin and warfarin is a reasonable alternative to use of apixaban.
- Duration – Minimum of 3 months. Total duration should be determined based on an individualized assessment of the patient’s risk of recurrent VTE and bleeding.

**Post-hospitalization:**

- VTE not documented
  - Patients treated empirically with intermediate or treatment-dose anticoagulation can be discharged on treatment dose apixaban (5mg PO BID) or rivaroxaban (20mg PO once daily) for 2 weeks without loading.
  - CKD – If CrCl <30 or on RRT, consider discharge on apixaban 2.5mg PO BID.
- VTE documented – Treat with standard VTE treatment dosing of apixaban or rivaroxaban for a minimum of 3 months. Total duration should be determined based on an individualized assessment of the patient’s risk of recurrent VTE and bleeding.
REFERENCES


