Confirmed COVID-19+ Patient

Labs on admission: PT, aPTT, and CBC with differential

Ongoing Monitoring: Based upon physician discretion and/or affiliate policy
- If worsening parameters, consider more aggressive critical care support
- Do not use blood products to correct non-bleeding coagulopathy

For pts <40 kg, dose adjustment may be needed
- If pharmacologic prophylaxis contraindicated: SCDs

Standard VTE Prophylaxis Preferred for MOST Hospitalized COVID 19+ Patients

BMI < 40: Enoxaparin 40mg SQ q24h
- CrCl 15-30 ml/min: Enoxaparin 30 mg SQ q24h
- CrCl <15 ml/min: UFH 5,000 units SQ BID or Q8h

BMI > 40: Enoxaparin 40mg SQ q12h
- CrCl 15-30 ml/min: Enoxaparin 30 mg SQ q24h
- CrCl <15 ml/min: UFH 7,500 units SQ BID or q8h

If infant is viable, consult Maternal Fetal Medicine for recommendations.

Therapeutic Anticoagulation (TX AC)

- Use anti-Xa monitoring unless on DOAC Prior to Admission
- Use LABUFHEP for anti-Xa monitoring for UFH
- Use LABFXA for anti-Xa monitoring for enoxaparin

On TX AC Prior to Admission
- Continue if no contraindication (avoid dexamethasone/direct factor Xa inhibitor- consider switch to enoxaparin).
  - Use enoxaparin if CrCl ≥ 15 ml/min
  - If CrCl <15 ml/min, multidisciplinary discussion

Pregnancy: If infant is viable, consult Maternal Fetal Medicine for recommendations.

Highly-Suspected or Confirmed VTE

- Use LMWH or UFH for all hospitalized patients who require TX AC. DOACs are not recommended for TX AC in COVID-19.
- If unable to get imaging & high clinical suspicion for VTE, recommend TX AC if no contraindications.
- Abnormal PT/PTT are not contraindications to TX AC in COVID-19.

Therapeutic Options:
- Enoxaparin 1 mg/kg SQ Q12h (preferred) or 1.5 mg/kg SQ Q24h
  - CrCl 15-30 ml/min: Enoxaparin 1 mg/kg SQ Q24h
  - CrCl <15 ml/min: use IV UFH ANTI因子XA (VTE-PE/DVT) order sets

Post-Hospitalization VTE Prophylaxis:

- If acute VTE confirmed at time of suspicion, continue TX AC for ≥ 3 months then re-assess.
- If VTE unconfirmed & treated empirically due to high suspicion, continue TX AC for 3 months regardless of subsequent (negative) imaging findings.

Sutter Health COVID-19 Pharmacologic VTE Prophylaxis Guidelines
Revision Date: February 2022
Appendix A: Standard vs Therapeutic Anticoagulation in COVID-19 Patients

Guidance from the NIH and ASH suggest using therapeutic-intensity over prophylactic-intensity anticoagulation for hospitalized patients with COVID-19 related illness who are not at risk for bleeding and not receiving ICU level care in the absence of suspected or confirmed VTE or another indication for anticoagulation. Other societal guidelines (i.e. Anticoagulation Forum, ISTH, CHEST, SCCM, WHO) favor the use of standard prophylactic anticoagulation for most hospitalized patients with COVID-19. However, updated guidance statements are not available within the last 12 months.

Findings from recent randomized controlled indicate that moderately affected COVID-19 patients may benefit from therapeutic-dose anticoagulation compared to standard prophylaxis. In critically ill COVID-19 patients, therapeutic anticoagulation offered no additional benefit compared to low or intermediate-dose thromboprophylaxis with a high probability of inferiority. Certainty of evidence regarding survival benefit, particularly in moderately ill patients, remains very low given variable interventions, primary outcomes measures, and different methods of analyses of recent randomized controlled trials. Available evidence is monitored regularly, and guidance is updated as more information becomes available. Please refer to Anticoagulation Evidence Review for more information.

Use of therapeutic anticoagulation for the purpose of thromboembolism prophylaxis should be done selectively in moderately ill patients with a determination of net clinical benefit. Additionally, the Anticoagulation Forum and ASH discourage the empiric use of full dose heparin or LMWH without other indications for therapeutic anticoagulation in severely (critically) ill patients outside of clinical trials. Until more data becomes available, clinicians are advised to follow the best available evidence when making treatment decisions for individual patients.

Appropriate dose and duration of anticoagulation (i.e. full therapeutic vs dose standard prophylaxis dose) should be a careful multidisciplinary decision, based upon the individual patient’s severity and duration of illness, deconditioning, mobility status, risks of thrombosis, and bleeding risk. Based on NIH guidance, for patients without a VTE who are started on therapeutic-dose anticoagulation, treatment should continue for 14 days or until hospital discharge, whichever comes first. For patients who start on therapeutic-dose anticoagulation while on low-flow oxygen due to COVID-19 and then transfer to the intensive care unit (ICU), therapeutic anticoagulation should be switched to prophylactic-dose heparin unless a VTE is highly suspected or confirmed.
Appendix B: Therapeutic Dosing Recommendations for Select Moderately ill Non-ICU Level Care Patients

Moderately ill patients included in the mpRCT conglomerate study were those admitted to an ICU but without receiving qualifying organ support. Most patients had a pre-existing condition (DM, HTN, chronic respiratory disease most common), generally had higher BMI (≥30), and required low flow nasal cannula or face mask. Patients with high bleeding risk including those on dual antiplatelet therapy were excluded.

**Therapeutic-Dose:**

- Enoxaparin 1 mg/kg SQ Q12h (preferred) or 1.5 mg/kg SQ Q24h
  - **CrCl 15-30 ml/min:** Enoxaparin 1 mg/kg SQ q24h
  - **CrCl <15 ml/min:** use IV UFH ANTIFACTOR XA (VTE-PE/DVT) order sets

Appendix C: Additional Recommendations for the Management of Anticoagulation in Pregnant COVID-19 Patients:

NIH and ASH guidelines currently recommend prophylactic-dose anticoagulation for pregnant patients hospitalized for severe COVID-19, if there are no contraindications to its use, and generally discontinued when the patient is discharged to home. Because pregnant patients have not been included in most clinical trials evaluating therapeutic anticoagulation in the setting of COVID-19, there is currently insufficient evidence to recommend either for or against therapeutic anticoagulation for pregnant patients with COVID-19 in the absence of a known VTE. Decisions regarding VTE prophylaxis in the pregnant and postpartum patient should be individualized, considering concomitant VTE risk factors.

Unfractionated heparin is generally preferred for pregnant patients who might be proximate to delivery because it is more readily reversed than low molecular weight heparin (LMWH). For these patients and those who have a contraindication to LMWH, prophylactic unfractionated heparin can be used. For pregnant patients who are unlikely to be delivered within a few days, prophylactic dose LMWH is reasonable (e.g., enoxaparin 40 mg subcutaneously daily or 0.5 mg/kg SQ daily). Hold prophylactic anticoagulation during active labor or if delivery is anticipated within 12-24 hours. Therapeutic anticoagulation can be considered for patients who require low flow-oxygen and have a D-dimer greater than 2 x ULN who are not at risk for emergent delivery or heavy bleeding. Shared decision making and individual risk assessment always recommended, MFM colleagues available for consultation PRN.

**Guidance for Therapeutic-Dosing in Pregnancy (Not at risk for urgent delivery or heavy bleeding):**

- Monitoring anti-factor Xa activity is recommended in pregnant women receiving therapeutic doses of enoxaparin. Peak anti-factor Xa activity levels are measured four to six hours after dosing, and the dose is titrated to maintain a target peak anti-factor Xa activity of approximately 0.6 to 1.2 units/mL.
- Monitoring of aPTT is recommended in pregnant women receiving therapeutic doses of heparin, measured six hours after injection. The dose should be adjusted to maintain the aPTT at 1.5 to 2.5 times the mean of the control value or the patient’s baseline aPTT value.

  - **BMI < 40 and determined viable per MFM and LOW risk for urgent delivery:** Enoxaparin 1 mg/kg SQ q24h
  - **BMI < 40 and determined viable per MFM and HIGH risk for urgent delivery:** UFH 10,000 units SQ q12h
  - **BMI ≥ 40 and determined viable per MFM and LOW risk for urgent delivery:** Enoxaparin 1 mg/kg SQ q12h
  - **BMI ≥ 40 and determined viable per MFM and HIGH risk for urgent delivery:** UFH 15,000 units SQ q12h or IV UFH