UCSF Guidelines for Prophylactic/Therapeutic Anticoagulation for Inpatients with COVID-19

1. COVID-associated coagulopathy and venous thromboembolism risk

- Most common pattern of coagulopathy is elevated fibrinogen & D-dimer, indicative of inflammation.
- Higher D-dimer and fibrinogen levels are associated with multi-organ dysfunction & worse prognosis (1).
- Overt DIC is rare, with median onset 4 days into hospitalization (2).
- Incidence of thrombosis in ICU patients may exceed 20%-40% even in patients on varying levels of prophylactic anticoagulation (3).

2. Initial considerations

- Labs on admission: CBC w/ diff, aPTT, PT/INR, fibrinogen, D-dimer.
- Repeat labs (every 2-3 days): CBC, aPTT, PT/INR, fibrinogen, D-dimer.
- Assess contraindications: All inpatients should receive prophylactic anticoagulation unless contraindications (platelets <25,000, fibrinogen <100 or high bleeding risk)..
- For patients on therapeutic anticoagulation at baseline (for VTE, AF, prosthetic valves, etc.): Continue anticoagulation unless contraindications.
    - If on warfarin or DOACs, consider switching to enoxaparin or unfractionated heparin (UFH) infusion, especially if severe illness

3. Venous thromboembolism prophylaxis

Standard prophylaxis dosing	Enoxaparin 40 mg SQ Qdaily
BMI/Weight >40/>120kg	Enoxaparin 40 mg SQ BID
CrCl 15-30mL/min **CrCl <15mL/min (or RRT)**	Enoxaparin 30 mg SQ Qdaily UFH 5000 units SQ q8 hours
Monitoring	Enoxaparin: If baseline elevated aPTT, obese, underweight, or CrCl<30, check peak anti-Xa level 4-6 hours after 3rd- 4th dose to ensure appropriate dose (goal 0.2-0.5)

4. Venous thromboembolism diagnostic evaluation and treatment

- D-dimer interpretation:
    - Elevated or rising D-dimer should not trigger evaluation or treatment for VTE unless other clinical signs/symptoms.
    - A D-dimer below the upper limit of normal can still be used to rule out VTE.
- If standard CTPE/DVT U/S/TTE cannot be obtained, reasonable to rely on diagnostic modalities that minimize risk of infectious spread, e.g.:
    - Provider-performed point of care U/S (POCUS) for DVT
    - Technician-performed DVT U/S (even if concern for PE)
    - Provider-performed POC TTE to assess for signs of right heart strain from PE
- Initiation of empiric, therapeutic anticoagulation without confirmed or high clinical suspicion of DVT/PE is controversial.
    - Our interpretation of current data is that risks outweigh benefits outside an RCT.
    - Same logic applies to empiric tPA for ARDS.
    - If persistent clotting of lines and/or worsening clinical course, therapeutic anticoagulation may be considered via multidisciplinary discussion.

Therapeutic dosing	
CrCl >30mL/min	Enoxaparin 1mg/kg SQ BID
CrCl <30mL/min	UFH infusion
Monitoring	Check concurrent anti-Xa level and aPTT at baseline and during the initial 12 hours of the infusion to ensure correlation (therapeutic goal 0.3-0.7). Assuming values correlate, use aPTT for ongoing monitoring.
Duration	3 months for provoked VTE unless ongoing indications

(1) Wang et al, *JAMA*, 2020; Zhou et al, *Lancet*, 2020 (2) Tang et al, *J Thromb Haemost*, 2020 (3) Klok et al, Thrombosis Res 2020.; Saskia et al, Preprint 2020.

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Questions: Consider Non-malignant Hematology consult