

COVID-19: Anticoagulation and Venous Thromboembolism Chemoprophylaxis Management

PURPOSE: To reduce the risk of venous thromboembolism (VTE) by providing appropriate means of chemical prophylaxis in appropriate (non-surgical, nonpregnant) patients.*

**Postoperative surgical patients should continue to be treated with appropriate VTE prophylaxis according to standard guidelines, regardless of COVID-19 status.*

CLINICAL GUIDELINE:

- **Pre-hospitalization anticoagulation can be continued for non-ICU cases**
 - If concern patient may decompensate or need a procedure, consider change to low molecular weight heparin (LMWH)/unfractionated heparin (UFH) at appropriate therapeutic or prophylactic doses (based on individual indication for anticoagulation and clinical condition)
- **Standard prophylactic anticoagulation should be used for hospitalized patients without hypoxemia and without confirmed or suspected VTE***
 - Use the COVID-19 inpatient order set
- **Consider empiric therapeutic anticoagulation with UFH or LMWH in hospitalized non-ICU-level COVID-19 patients with ALL of the following:**
 - **low-flow oxygen AND elevated D-dimer above upper limit of normal AND no increased bleeding risk**
 - **Contraindications:** platelet count < 50x10⁹/L, hemoglobin < 8 g/dL, need for dual antiplatelet therapy, known bleeding in past 30 days requiring ER visit or hospitalization, known bleeding disorder.
 - Heparin and low-molecular-weight heparin should be used for 14 days or hospital discharge, whichever comes first
 - Do not use therapeutic-dose oral anticoagulants (e.g. DOAC or warfarin)
 - Patients who are unable to receive therapeutic anticoagulation should receive standard prophylactic anticoagulation
- **Standard prophylactic anticoagulation should be used for hospitalized patients requiring high-flow nasal cannula or ICU-level care who do not have confirmed or suspected VTE***
 - Use the COVID-19 inpatient order set
- **Post-discharge VTE prophylaxis is not recommended unless confirmed VTE or another indication for anticoagulation**

REFERENCES

Leclerc JR, Geerts WH, Desjardins L. et al. Prevention of deep vein thrombosis after major knee surgery – a randomized, double-blind trial comparing a low molecular weight heparin fragment (enoxaparin) to placebo. *Thromb Haemost* 1992; 67: 417-423.

Spyropoulos AC, Ageno W, Albers GW, Elliott CG, Halperin JL, Hiatt WR, et al. Rivaroxaban for Thromboprophylaxis after Hospitalization for Medical Illness. *New England Journal of Medicine*.2018; 379 (12):1118–27.3)

The EAST Practice Management Guidelines Work Group Frederick B. Rogers, MD, Mark D. Cipolle, MD, PhD, George Velmahos, MD, PhD, Grace Rozycki, MD, and Fred A. Luchette, MD *J Trauma*. 2002;53:142–164.

DeMuro JP, Hanna AF (2013) Prophylaxis of Deep Venous Thrombosis in Trauma Patients: A Review. *J Blood Disorders Transf* 4:151.

REMAP-CAP Investigators, ACTIV-4a Investigators, ATTACC Investigators. Therapeutic Anticoagulation with Heparin in Critically Ill Patients with Covid-19. *N Engl J Med*. 2021;385(9):777. Epub 2021 Aug 4.

ATTACC Investigators, ACTIV-4a Investigators, REMAP-CAP Investigators. Therapeutic Anticoagulation with Heparin in Noncritically Ill Patients with Covid-19. *N Engl J Med*. 2021;385(9):790. Epub 2021 Aug 4.

Giannis D, Allen SL, Tsang J, Flint S, Pinhasov T, Williams S, Tan G, Thakur R, Leung C, Snyder M, Bhatia C, Garrett D, Cotte C, Isaacs S, Gugerty E, Davidson A, Marder GS, Schnitzer A, Goldberg B, McGinn T, Davidson KW, Barish MA, Qiu M, Zhang M, Goldin M, Matsagkas M, Arnaoutoglou E, Spyropoulos AC. Postdischarge thromboembolic outcomes and mortality of hospitalized patients with COVID-19: the CORE-19 registry. *Blood*. 2021;137(20):2838.

Roberts LN, Whyte MB, Georgiou L, Giron G, Czuprynska J, Rea C, Vadher B, Patel RK, Gee E, Arya R. Postdischarge venous thromboembolism following hospital admission with COVID-19. *Blood*. 2020;136(11):1347.

Patell R, Bogue T, Koshy A, Bindal P, Merrill M, Aird WC, Bauer KA, Zwicker JI. Postdischarge thrombosis and hemorrhage in patients with COVID-19. *Blood*. 2020;136(11):1342.

Sholzberg M et al. Randomized trials of therapeutic heparin for COVID-19: A meta-analysis. *Research Pract Thromb Haemost*. 2021; DOI: 10.1002/rth2.12638

National Institutes of Health. (2020 January 5.) The COVID-19 Treatment Guidelines Panel’s Statement on Anticoagulation in Hospitalized Patients with COVID-19. NIH COVID-19 Treatment Guidelines. <https://www.covid19treatmentguidelines.nih.gov/therapies/statement-on-anticoagulation-in-hospitalized-patients/>