Coagulation abnormalities in COVID-19 patients

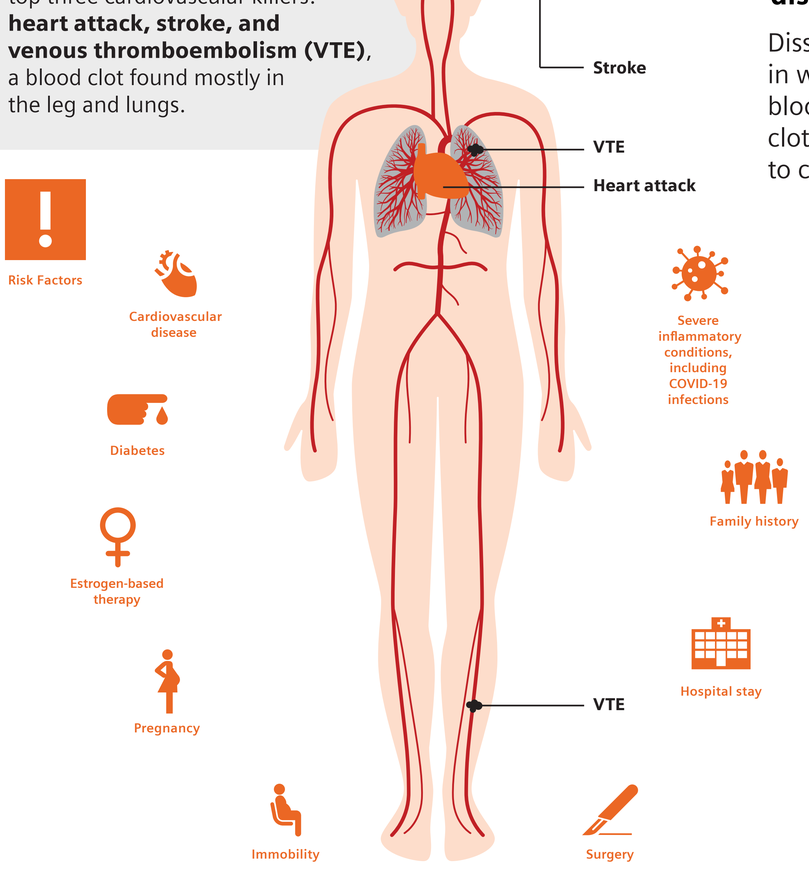
Supporting labs in the diagnosis, treatment, and management of COVID-19 patients

COVID-19 patients are experiencing serious—and sometimes fatal—clotting abnormalities.

Studies show that **about 25%[1]—or even up to 70%[2]**—of critically ill patients have confirmed venous thromboembolism (VTE) or pulmonary embolism (PE).

What is thrombosis?

Thrombosis is a blood clot that forms in an artery or vein. It is the one disorder that causes the world's top three cardiovascular killers: **heart attack, stroke, and venous thromboembolism (VTE)**, a blood clot found mostly in the leg and lungs.

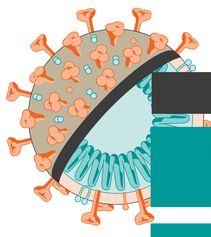


In one study,

~70%

of COVID-19 patients who died had disseminated intravascular coagulation (DIC).[3]

Disseminated intravascular coagulation is a condition in which small blood clots develop throughout the bloodstream, blocking small blood vessels. The increased clotting depletes the platelets and clotting factors needed to control bleeding, causing excessive bleeding.



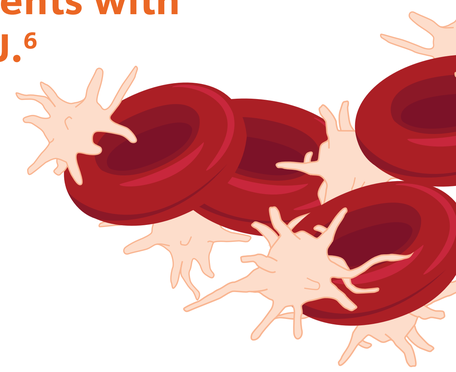
Hospitalized Patients	
Early to mid-term phase	**Critical phase**
↑ D-dimer	↓ Platelet count
↑ PT INR	↓ Antithrombin
↑ Fibrinogen*	↓ Fibrinogen*

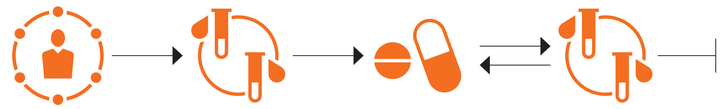
Siemens Healthineers has been recognized as a global leader in hemostasis testing for more than

40 years.

A study showed COVID-19 patients with D-dimer levels >2 mg/L FEU were 50 times more likely to die than patients with D-dimer levels <2 mg/L FEU.[6]

Elevated D-dimer levels were found to be a crucial laboratory marker to indicate a thrombotic risk in COVID-19 patients.[3-5] Following a COVID-19 diagnosis, hemostasis testing, therapy, and monitoring have been shown to play a decisive role in COVID-19 patient management.





Increased production of vital coagulation assays

Our coagulation tests are playing an important role in the diagnosis, treatment, and management of coagulation abnormalities in COVID-19 patients. Due to increased demand of these tests, Siemens Healthineers has increased production volumes to respond to the pandemic.

*Fibrinogen levels are increased in hospitalized patients due to inflammation in the early to mid-term phase of COVID-19.[7] If patients progress to a critical phase of COVID-19, fibrinogen levels are markedly reduced, as observed in DIC.[3]

1. Klok FA, et al. Incidence of thrombotic complications in critically ill ICU patients with COVID-19. Thromb Res. 2020 Apr 10.
2. Llitjos, et al. High incidence of venous thromboembolic events in anticoagulated severe COVID-19.J Thromb Haemost. 2020.
3. Tang N, et al. Abnormal coagulation parameters are associated with poor prognosis in patients with novel coronavirus pneumonia. J Thromb Haemost. 2020;18:844-847.
4. Bikdeli B, et al. COVID-19 and thrombotic or thromboembolic disease: implications for prevention, antithrombotic therapy, and follow-up. J Am Coll Cardiol. 2020.
5. Lippi G, Favaloro EJ. D-dimer is associated with severity of coronavirus disease 2019: a pooled analysis. Thromb Haemost. 2020.
6. Zhang L, et al. D-dimer levels on admission to predict in-hospital mortality in patients with Covid-19. J Thromb Haemost. 2020.
7. Barrett CD, et al. ISTH interim guidance on recognition and management of coagulopathy in COVID-19: a comment. J Thromb Haemost. 2020.

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