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categorical variables, and adjusted logistic regression was used to compare MSOF rates.

Results: We identified a total of 48,066 patients treated at the VA who had contracted COVID-19 during the study period. Of these patients, 879 (1.8%) were receiving chronic therapeutic anticoagulation before contracting COVID-19. The anticoagulation regimens included apixaban (55.6%), rivaroxaban (19.1%), and warfarin (15.5%). Patients receiving anticoagulation were more likely to be older (72 vs 59; $P < .01$) and to have cardiovascular risk factors such as diabetes (56.8% vs 31.4%; $P < .01$), hypertension (91.8% vs 54.5%; $P < .01$), hyperlipidemia (84.6% vs 53.6%; $P < .01$), and coronary disease (46.9% vs 15.3%; $P < .01$). They were also more likely to have a history of venous thromboembolism (25.3% vs 3.3%; $P < .01$). Despite the greater comorbidity rates for patients receiving anticoagulation, no differences were observed in ICU admission (24.9% vs 23.6%; $P = .7$) and hospital/ICU mortality rates (11.2% vs 10.2%; $P = .5$). Logistic regression analysis adjusted for cardiovascular morbidity indicated that among patients with prior venous thromboembolism, those who had received outpatient anticoagulation had a 55% decreased odds of composite MSOF (odds ratio, 0.45; $P = .002$).

Conclusions: Our large retrospective database analysis is the first to suggest that outpatient therapeutic anticoagulation might have a beneficial effect on patients with cardiovascular risk factors after COVID-19 infection. Unlike previous studies, which demonstrated that patients with advanced age, diabetes, and cardiovascular disease have increased in-hospital mortality, our study observed that these higher risk individuals had notably lower rates of hospital/ICU admission, MSOF, and ICU mortality.

	Outpatient anticoagulation					
	All			Hospitalized		
Cohort	No	Yes	*P* value	No	Yes	*P* value
Patients, No.	47,187	879		9352	29	
Demographics						
Age, years	59	72	<.05	69	73	<.05
Diabetes, %	31.4	56.8	<.05	77.0	94.2	<.05
Hypertension, %	54.5	91.8	<.05	94.2	77.0	<.05
Hyperlipidemia, %	53.6	84.6	<.05	69.6	83.0	<.05
Coronary artery disease, %	15.3	46.9	<.05	27.7	51.7	<.05
Venous thromboembolism, %	3.3	25.3	<.05	7.2	28.9	<.05
Outcomes, %						
Intensive care unit admission	4.7	9.3	<.05	23.6	24.9	.74
Intensive care unit death	2.0	4.2	<.05	10.2	11.2	.54
Hospital death	1.7	4.0	<.05	8.8	10.6	.24

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RS09.

Clinical Outcomes in Peripheral Artery Disease With Coronavirus Disease 2019: A Multicenter Research Network Study

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Objective: The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), causing coronavirus disease 2019 (COVID-19) infection has resulted in a global pandemic, and it has been shown that patients with comorbidities have worse clinical outcomes from COVID-19 compared with otherwise healthy patients. Peripheral artery disease (PAD) is an atherosclerotic occlusive disease in the periphery affecting 8 to 12 million U.S. adults. However, whether PAD patients have worse clinical outcomes with SARS-CoV-2 infection remains unknown. Accordingly, the primary aim of our study was to examine the clinical outcomes of COVID-19 patients with PAD and determine whether they have an increased risk of mortality, hospitalization, and ventilator dependence.

Methods: A real-time search and analysis were performed for patients diagnosed with COVID-19 using the TriNetX (Cambridge, Mass) research network, a global federated health research network providing access to electronic medical records (diagnoses, procedures, medications, laboratory values) from ~63 million patients in 45 large healthcare organizations. The TriNetX platform only uses aggregated counts and statistical summaries of de-identified information. We identified COVID-19 patients (age, ≥60 years) with preexisting PAD (n = 964) and without PAD (n = 52,667). The two groups were compared for the risk of 28-day mortality, hospitalization, and ventilator dependence with and without propensity score matching for confounding factors.

Results: We used propensity score matching to match the COVID-19 patients with and without PAD for age, sex, race, and comorbidities. Before propensity score matching, COVID-19 patients with PAD had significantly higher mortality (risk ratio [RR], 2.09; 95% confidence interval [CI], 1.78-2.46; $P < .0001$), hospitalization (RR, 1.54; 95% CI, 1.46-1.63; $P < .0001$), and ventilator dependence (RR, 2.06; 95% CI, 1.61-2.64; $P < .0001$) compared with the COVID-19 patients without PAD. After propensity score matching, the COVID-19 patients with PAD still had a greater risk of 28-day hospitalization (RR, 1.24; 95% CI, 1.14-1.34; $P < .0001$) compared with the COVID-19 patients without PAD.

Conclusions: In general, COVID-19 patients with PAD have a lower survival probability, a higher rate of hospital admission, and a higher likelihood of requiring a ventilator compared with COVID-19 patients without PAD. Moreover, even after adjusting for comorbidities and confounding factors, compared with the non–PAD COVID-19 patients, the COVID-19 patients with PAD had a greater chance of requiring hospital admission. This finding suggests that PAD is an important risk factor for short-term hospital admission for patients with COVID-19.

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SS09.

The Coronavirus Disease 2019 Likelihood of Thrombosis Calculator: Predicting Venous Thromboembolism Risk in Hospitalized Patients With Coronavirus Disease 2019

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Objective: Emerging data have suggested that venous thromboembolism (VTE) occurrence in those with coronavirus disease 2019 (COVID-19) is associated with higher mortality rates. However, a paucity of data is available exploring which patients with COVID-19 have the highest risk of VTE development. Furthermore, no clear consensus has been reached regarding which patients warrant more or less aggressive antithrombotic therapy. We sought to develop a risk model to help clinicians predict which patients with COVID-19 might be more prone to VTE development.

Methods: A prospectively maintained registry of all COVID-19–related admissions between March and September 2020 was reviewed. Administrative database coding and medical record review were used to individually confirm the VTE diagnosis. Routine venous duplex ultrasound surveillance was not performed. Univariate and multivariate analyses

were completed to determine the demographic, census-level, and laboratory biomarkers associated with VTE development. Prediction modeling was performed using logistic regression analyses of statistically and clinically significant risk factors. Bootstrapping was used for the estimation of internal validity of the predictive model.

Results: A total of 2552 patients were admitted with COVID-19–related illnesses, 126 (4.9%) of whom had developed an in-hospital VTE. The in-hospital mortality rate was 9.4%, and the 90-day mortality rate was 11.0%. VTE was independently associated with mortality (odds ratio, 3.59; 95% confidence interval, 2.33-5.54). Univariate and multivariate analyses demonstrated that multiple patient-level, hospital course, and laboratory biomarkers were associated with VTE development (Table). Age >65 years, birth sex, race, markers of coagulation and hemostatic activation profile score, negative D-dimer result, maximum D-dimer level, history of hypertension, intensive care unit status, insurance status, and median family income extrapolated by zip code were included to build the predictive model. The developed risk calculator demonstrated a positive predictive value of 97.7%, sensitivity of 70.2%, and specificity of 73.2%, with an area under the receiver operating characteristic curve of 0.77 and concordance statistic of 0.73 (Fig).

Conclusions: VTE development is independently associated with mortality in patients hospitalized with COVID-19. Prevention and/or early treatment of VTE among patients with COVID-19 could save lives. Our CLOT (COVID-19 likelihood of thrombosis) prediction model can assist with risk stratification for VTE development among COVID-19 admissions and better inform clinical decision-making regarding institutional antithrombotic protocols to reduce the bleeding risk and improve outcomes. Further studies are required to validate this model among other national clinical registries.

Table. Odds ratios for some factors in univariate and multivariate analyses, including factors constituting the CLOT prediction model

	VTE development		Univariate analysis		Multivariate analysis	
Risk factor	Yes (n = 126)	No (n = 2426)	Crude OR (95% CI)	*P* value	aOR[a] (95% CI)	*P* value
Age, years						
>65	72 (57.14)	1516 (62.49)	1.23 (0.85-1.77)	.26S65 years, univariate analysis.	1.31 (0.83-2.08)	.247
≤65	54 (42.86)	910 (37.51)	NA	NA	NA	NA
Birth sex						
Female	64 (50.79)	1215 (50.08)	1.03 (0.72-1.47)	.876	1.37 (0.89-2.13)	.147
Male	62 (49.21)	1211 (49.92)	NA	NA	NA	NA
Race						
Black	90 (77.59)	1400 (66.73)	1.63 (1.03-2.58)	**.038**	0.83 (0.48-1.46)	.505
Other	2 (1.72)	91 (4.34)	0.56 (0.13-2.39)	.431	0.7 (0.13-2.3)	.586
White	24 (20.69)	607 (28.93)	NA	NA	NA	NA
Ethnicity						
Hispanic/Latinx	11 (9.4)	247 (11.47)	0.80 (0.42-1.51)	.493	NA	NA
Non–Hispanic/Latinx	106 (90.6)	1906 (88.53)	NA	NA	NA	NA
ICU status						
Yes	70 (55.56)	771 (31.78)	2.68 (1-87-3.85)	**<.001**	1.2 (0.74-1.95)	.451
No	56 (44.44)	1655 (68.22)	NA	NA	NA	NA
Insurance status						
Yes	122 (96.83)	2350 (96.87)	0.94 (0.62-1.41)	.76	2.55 (0.77-6.86)	.117
No	4 (3.17)	76 (3.13)	NA	NA	NA	NA
MOCHA profile score						
0	4 (3.17)	155 (6.39)	0.55 (0.20-1.51)	.245	1.63 (0.5-4.18)	.378
1	9 (7.14)	179 (7.38)	1.06 (0.52-2.16)	.864	1.13 (0.44-2.49)	.784
2	10 (7.94)	196 (8.08)	1.08 (0.55-2.13)	.824	0.89 (0.41-1.76)	.749
3	12 (9.52)	166 (6.84)	1.53 (0.81-2.88)	.187	1.26 (0.61-2.43)	.514
4	18 (14.29)	185 (7.63)	2.06 (1 20-3.53)	.008	0.71 (0.34-1.37)	.314
NA	73 (57.94)	1545 (63 .69)	NA	NA	NA	NA
History of hypertension						
Yes	95 (75.4)	1724 (71.06)	1.25 (0.82-1.89)	.296	0.66 (0.39-1.14)	.131
No	31 (24.6)	702 (28.94)	NA	NA	NA	NA
Negative D-dimer[b]						
Yes	0 (0)	357 (14.72)	0.02 (0.01-0.37)[c]	**.008**	0 04 (0-0.29)	**<.001**
No	126 (100)	2069 (85.28)	NA	NA	NA	NA
Maximum CRP, mg/L	202.2 ± 130.12	146.23 ± 111.81	1.00 (1 00-1.01)	**<.001**	NA	NA
Maximum D-dimer, ng/mL	22,616.73 ± 23,765.73	6453.04 ± 13,887.61	1.00 (1 00-1.00)	**<.001**	1.00003 (1.00002-1.00004)	**<.001**
Hospital length of stay, days	13.56 ± 14.79	8.84 ± 9.59	1.03 (1 02-1.05)	**<.001**	NA	NA

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Table. Continued.

Risk factor	VTE development		Univariate analysis		Multivariate analysis	
	Yes (n = 126)	No (n = 2426)	Crude OR (95% CI)	*P* value	aOR[a] (95% CI)	*P* value
Median family income, $	$62,529.57± $25,179.72	$70,036.61± $31,599.19	1.00 (1 00-1.00)	**.009**	0.99999 (0.99998-1.00000)	.07
Foreign place of birth, %	11.87 ± 9.74	14.36 ± 10.79	0.98 (0.96-0.99)	**.012**	NA	NA
Unemployment rate, %	9.79 ± 3.98	8.64 ± 4.16	1.07 (1.02-1.11)	**.002**	NA	NA
Poverty rate for civilians aged >65 years, %	13.11 ± 7.81	11.22 ± 6.51	1.04 (1.01-1.06)	**.002**	NA	NA

aOR, Adjusted odds ratio; *CI*, confidence interval; *CLOT*, coronavirus disease 2019 likelihood of thrombosis; *CRP*, C-reactive protein; *ICU*, intensive care unit; *MOCHA*, markers of coagulation and hemostatic activation; *NA*, not applicable; *OR*, odds ratio; *VTE*, venous thromboembolism.
Boldface *P* values represent statistical significance.
[a]Firth's bias-reduced logistic regression.
[b]Defined as <574 ng/mL.
[c]Haldane-Anscombe correction.

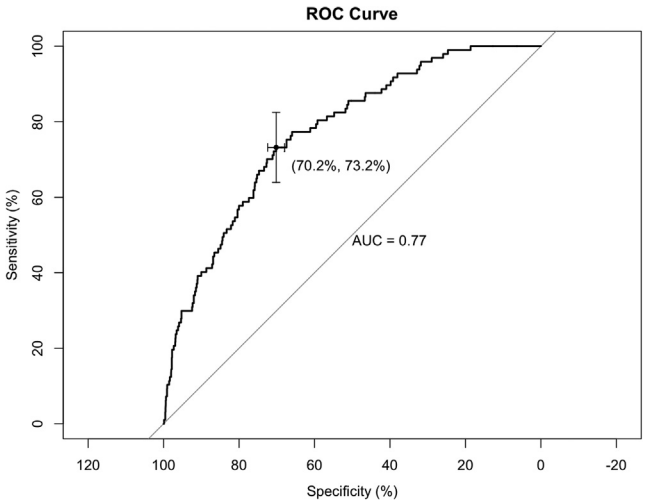

Fig. Receiver operating characteristic (*ROC*) curve for the *CLOT* (coronavirus disease 2019 likelihood of thrombosis) prediction model.

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RS10.

Effect of Coronavirus Disease 2019–Related Delays of Scheduled Operations for Patients With Chronic Limb Threatening Ischemia

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Objective: The goal of the VASCC (vascular surgery COVID-19 [coronavirus disease 2019] collaborative) study was to determine the influential characteristics of a population with severe peripheral artery disease (PAD) and/or chronic limb threatening ischemia (CLTI) during the COVID-19 pandemic for whom postponement of scheduled procedures could have affected the outcomes.

Methods: VASCC, founded in March 2020, is an international multicenter observational study of a subset of PAD/CLTI patients for whom planned interventions were postponed during the COVID-19 pandemic surge. The following interim data were collected for 165 patients in the United States: demographics, comorbidities, wound ischemia foot infection (WIfI) stage, indication and planned surgery, location of surgery, time delay, change in surgical plan, and adverse events. Descriptive statistics were used for the interim data.

Results: For the 165 index patients, the average length of delay to surgery was 59.3 ± 50.4 days (median, 47.0 days; range, 1-241). Of the 165 patients, 66 had a baseline WIfI grade and stage available. Wound grades of 1 and 3 were equally prevalent (n = 22; 33.3%), and an ischemia grade of 3 was most prevalent (n = 56; 84.8%). Foot infection grade 0 was the most prevalent (n = 53; 80.3%). WIfI clinical stage 3 (indicating a moderate risk of amputation) was the most prevalent. The frequency of the surgical indications (Table) was as follows: severe claudication, n = 36 (21.8%); minor tissue loss, n = 33 (20.0%); rest pain, n = 27 (16.4%); and major tissue loss, n = 26 (15.8%). Intervention for a threatened bypass was required for six patients (3.6%) and for critical in-stent stenosis in three (1.8%). In the severe claudication group, four patients (11.1%) developed rest pain and one (2.7%) experienced minor tissue loss during the delay for the planned intervention. In the minor tissue loss group, one patient (3.0%) had progressed to extensive tissue loss. From the interim cohort, eight delayed patients (4.8%) required conversion of planned, elective surgery to emergent surgery (Table). The indications for emergency surgery were progressive tissue loss for five (62.5%), critical in-stent restenosis for two (25%), and threatened bypass for one patient (12.5%). The primary major adverse event after emergency surgery was major limb amputation for four of the eight patients (50%). At the last follow-up, 10 of the 165 limbs (6.1%) have required a major limb amputation and 7 (4.2%) a minor amputation.

Conclusions: COVID-19–related delays in intervention for patients with severe PAD or CLTI led to a low observed, yet unpredictable, rate of decompensation. Nonetheless, for the patients who had required conversion of planned, elective surgery to an emergency operation, the outcomes were catastrophic, with a 50% risk of major amputation.

Table. Indications for planned surgery and emergency adverse events

Variable	Patients	Worsening from original indication (N = 165)	Indication for emergency surgery (N = 8)
Indication for planned surgery (N = 165)			
Asymptomatic	6 (3.6)	0 (0)	0 (0)
Claudication			
Mild	9 (5.5)	1 (11.1)	0 (0)
Moderate	16 (9.7)	0 (0)	0 (0)
Severe	36 (21.8)	5 (13.9)	0 (0)
Rest pain	27 (16.4)	0 (0)	0 (0)
Tissue loss			
Minor	33 (16.4)	1 (3)	0 (0)
Extensive	26 (15.8)	0 (0)	5 (62.5)
Threatened bypass	6 (3.6)	0 (0)	1 (12.5)

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