

# 15 - Prophylactic Anticoagulation

## Recommendation

### Guideline

S3-Leitlinie Empfehlungen zur stationären Therapie von Patienten mit COVID-19 – Living Guideline - <https://register.awmf.org/de/leitlinien/detail/113-001LG>

### Summary

#### German

Hospitalisierte Patienten mit COVID-19 sollen in Abwesenheit von Kontraindikationen eine standardmäßige medikamentöse Thromboembolieprophylaxe mit niedermolekularem Heparin erhalten. Alternativ kann Fondaparinux zur Anwendung kommen.

#### English (machine translation)

Hospitalized patients with COVID-19 should receive standard drug thromboembolism prophylaxis with low molecular weight heparin in the absence of contraindications. Alternatively, fondaparinux may be used.

### Justification

#### German

Thromboembolische Ereignisse sind eine häufige Komplikation bei COVID-19 und betreffen vorwiegend das venöse, jedoch auch das arterielle Gefäßsystem (112-114). Alle stationär behandelten Patienten sollen daher zur Prophylaxe einer venösen Thromboembolie (VTE) niedermolekulares Heparin (NMH) in einer für den Hochrisikobereich zugelassenen Dosierung erhalten, z. B. Enoxaparin 4.000 IE, Dalteparin 5.000 IE, Tinzaparin 4.500 IE, Certoparin 3.000 IE, Nadroparin (< 70kg KG 3.800 IE, > 70kg KG 5.700 IE). Alternativ, z.B. bei Heparinunverträglichkeit oder stattgehabter heparininduzierter Thrombozytopenie (HIT), ist die Gabe von Fondaparinux möglich. Die Empfehlung basiert auf der S3-Leitlinie Prophylaxe der venösen Thromboembolie (115). Der Nutzen einer medikamentösen VTE-Prophylaxe, vorzugsweise mit NMH, bei stationären Patienten mit akuten internistischen Erkrankungen und Bettlägerigkeit wurde in mehreren randomisierten Studien prospektiv untersucht. Bezüglich hospitalisierter Patienten mit COVID-19 liegen zwar keine spezifischen Studiendaten zur VTE-Prophylaxe vor; die bisher verfügbare Evidenz ist aber auf die Pandemiesituation übertragbar. Unter Berücksichtigung von Kontraindikationen reduziert die Thromboseprophylaxe mit NMH (oder alternativ mit Fondaparinux) hochwirksam das VTE-Risiko, ohne das Risiko für schwere Blutungen signifikant zu erhöhen.







#### English (machine translation)

Thromboembolic events are a common complication of COVID-19 and predominantly affect the venous but also the arterial vasculature (112-114). Therefore, all hospitalized patients should receive low-molecular-weight heparin (NMH) for prophylaxis of venous thromboembolism (VTE) at a dosage approved for high-risk settings, e.g., enoxaparin 4,000 IU, dalteparin 5,000 IU, tinzaparin 4,500 IU, certoparin 3,000 IU, nadroparin (< 70kg bw 3,800 IU, > 70kg bw 5,700 IU). Alternatively, e.g. in cases of heparin intolerance or previous heparin-induced thrombocytopenia (HIT) administration of fondaparinux is possible. The recommendation is based on the S3 guideline Prophylaxis of venous thromboembolism (115). The benefit of drug-based VTE prophylaxis, preferably with NMH, in hospitalized patients with acute internal diseases and bed confinement, has been prospectively investigated in several randomized trials. Regarding hospitalized patients with COVID-19, there are no specific trial data on VTE prophylaxis; however, the evidence available to date is applicable to the pandemic situation. Considering contraindications, thromboprophylaxis with NMH (or alternatively with fondaparinux) is highly effective in reducing the risk of VTE without significantly increasing the risk of major bleeding.



Note: Drug doses for determining whether an anticoagulant dose is therapeutic can be found on [18 - No Anticoagulation](#)



### Population

		Inclusion  / Exclusion 	Name	Category	definition.type	definition.value
PopHospitalisedCOVID19PatientsWOVenousThrombosisWOCI	Population for recommendation 15: Hospitalised COVID-19 patients without (venous) thrombosis and without contraindications to LWMH.		COVID-19	Condition	SCT 404684003 "Clinical finding (finding)"	\$sct#840539006 "Disease caused by Severe acute respiratory syndrome coronavirus 2 (disorder)"
		 any-of	HIT 2	Condition	SCT 404684003 "Clinical finding (finding)"	\$sct#111588002 "Heparin-induced thrombocytopenia with thrombosis (disorder)"
			Heparin Allergy	Allergy	SCT 609328004 "Allergic disposition (finding)"	\$sct#294872001 "Allergy to heparin (finding)"
			Heparinoid Allergy	Allergy	SCT 609328004 "Allergic disposition (finding)"	\$sct#294876003 "Allergy to heparinoid (finding)"
PopHospitalisedCOVID19PatientsWOVenousThrombosisWITHCI	Population for recommendation 15: Hospitalised COVID-19 patients without (venous) thrombosis, existing contraindications to LWMH.		COVID-19	Condition	SCT 404684003 "Clinical finding (finding)"	\$sct#840539006 "Disease caused by Severe acute respiratory syndrome coronavirus 2 (disorder)"
		 any-of	HIT 2	Condition	SCT 404684003 "Clinical finding (finding)"	\$sct#111588002 "Heparin-induced thrombocytopenia with thrombosis (disorder)"
			Heparin Allergy	Allergy	SCT 609328004 "Allergic disposition (finding)"	\$sct#294872001 "Allergy to heparin (finding)"
			Heparinoid Allergy	Allergy	SCT 609328004 "Allergic disposition (finding)"	\$sct#294876003 "Allergy to heparinoid (finding)"

## Intervention



Note: Drug doses for determining whether an anticoagulant dose is therapeutic can be found on [18 - No Anticoagulation](#)

Name	Description	Population			Actions/Activities					
			selection-behaviour	selection-behaviour	Name	Action Category	productCodeableConcept	Route	Drug Dosage	perform doNotP
AntithrombLWMHProphylaxisHospitalisedCOVID19PatientsRecommendation	Antithrombotic prophylaxis with LWMH in hospitalised COVID-19 patients	PopHospitalised COVID19-PatientsWOVenous ThrombosisWOCI			ProphylacticAnticoagulationWDalteparin	drugAdministration	\$atcde#B01AB04 "Dalteparin (substance)" \$sct#372563008 "Dalteparin (substance)"	subcutaneous	<ul style="list-style-type: none"><li>2500 IU/d</li><li>5000 IU/d</li></ul>	
					ProphylacticAnticoagulationWEnoxaparin	drugAdministration	\$atcde#B01AB05 "Enoxaparin (substance)" \$sct#372562003 "Enoxaparin (substance)"	subcutaneous	<ul style="list-style-type: none"><li>20 mg/d</li><li>40 mg/d</li></ul>	
					#exactly (1)					

ProphylacticAnticoagulationW/NadroparinLow Weight	drugAdministration	\$atcde#B01AB06 "Nadroparin" \$sct#699946002 "Nadroparin (substance)"	subcutaneous	<table><tr><th>Weight (kg)</th><th>Dose (1x/d)</th></tr><tr><td>70kg</td><td>3800 IE</td></tr><tr><td>&gt;70kg</td><td>5700 IE</td></tr></table>	Weight (kg)	Dose (1x/d)	70kg	3800 IE	>70kg	5700 IE									
Weight (kg)	Dose (1x/d)																		
70kg	3800 IE																		
>70kg	5700 IE																		
ProphylacticAnticoagulationW/NadroparinHigh Weight	drugAdministration	<del>\$atcde#B01AB06 "Nadroparin"</del> <del>\$sct#699946002 "Nadroparin (substance)"</del>	subcutaneous	<del>= 5700 IE/d</del> <del>(for weight &gt; 70 kg)</del>															
ProphylacticAnticoagulationWCertoparin	drugAdministration	\$atcde#B01AB13 "Certoparin" \$sct#395961003 "Certoparin (substance)"	subcutaneous	= 3000 IE/d															
ProphylacticAnticoagulationWTinzaparin	drugAdministration	\$atcde#B01AB10 "Tinzaparin" \$sct#412608008 "Tinzaparin (substance)"	subcutaneous	= 3.500 IE															
ProphylacticAnticoagulationWHeparinSC	drugAdministration	\$atcde#B01AB01 "Heparin" \$sct#372877000 "Heparin (substance)"	subcutaneous	<ul style="list-style-type: none"><li>• 5000 IE 2x/day</li><li>• 5000 IE 3x/day</li><li>• 7500 IE 2x/day</li></ul>															
NoTherapeuticAnticoagulationWDalteparin1xd	drugAdministration	\$atcde#B01AB04 "Dalteparin" \$sct#372563008 "Dalteparin (substance)"	subcutaneous	=200 IE/kg 1x/d															
NoTherapeuticAnticoagulationWDalteparin2xd	drugAdministration	\$atcde#B01AB04 "Dalteparin" \$sct#372563008 "Dalteparin (substance)"	subcutaneous	=100 IE/kg 2x/d															
TherapeuticAnticoagulationNMEHEnoxaparin2xd	drugAdministration	\$atcde#B01AB05 "Enoxaparin" \$sct#372562003 "Enoxaparin (substance)"	subcutaneous	<table><tr><th>Weight (kg)</th><th>Daily Dose (IE)</th></tr><tr><td>46 - 56</td><td>10.000</td></tr><tr><td>57 - 68</td><td>12.500</td></tr><tr><td>69 - 82</td><td>15.000</td></tr><tr><td>&gt; 83</td><td>18.000</td></tr></table>	Weight (kg)	Daily Dose (IE)	46 - 56	10.000	57 - 68	12.500	69 - 82	15.000	> 83	18.000					
Weight (kg)	Daily Dose (IE)																		
46 - 56	10.000																		
57 - 68	12.500																		
69 - 82	15.000																		
> 83	18.000																		
NoTherapeuticAnticoagulationWEnoxaparin1xd	drugAdministration	\$atcde#B01AB05 "Enoxaparin" \$sct#372562003 "Enoxaparin (substance)"	subcutaneous	1.5 mg/kg; 1x/d															
TherapeuticAnticoagulationNMEHEnoxaparin2xd	drugAdministration	\$atcde#B01AB05 "Enoxaparin" \$sct#372562003 "Enoxaparin (substance)"	subcutaneous	1 mg/kg ; 2x/d															
NoTherapeuticAnticoagulationWNadroparin	drugAdministration	\$atcde#B01AB06 "Nadroparin" \$sct#699946002 "Nadroparin (substance)"	subcutaneous	<ul style="list-style-type: none"><li>• 2x/d according to:</li></ul> <table><tr><th>Weight (kg)</th><th>Dose s.c. (IE; 2x/d)</th></tr><tr><td>&lt; 50</td><td>3800</td></tr><tr><td>50 bis 59</td><td>4750</td></tr><tr><td>60 bis 69</td><td>5700</td></tr><tr><td>70 bis 79</td><td>6650</td></tr><tr><td>80 bis 89</td><td>7600</td></tr><tr><td>90</td><td>8550</td></tr></table>	Weight (kg)	Dose s.c. (IE; 2x/d)	< 50	3800	50 bis 59	4750	60 bis 69	5700	70 bis 79	6650	80 bis 89	7600	90	8550	
Weight (kg)	Dose s.c. (IE; 2x/d)																		
< 50	3800																		
50 bis 59	4750																		
60 bis 69	5700																		
70 bis 79	6650																		
80 bis 89	7600																		
90	8550																		

					NoThera peuticAnti coagulati onWCert oparin	drugAdminist ration	\$atcde#B01AB13 "Certoparin"  \$sct#395961003 "Certoparin (substance)"	subcutan eous	8000 IE 2x/d	⊖								
					NoThera peuticAnti coagulati onWUFH OrArgatra	drugAdminist ration	\$atcde#B01AB01 "Heparin"  \$sct#372877000 "Heparin (substance)"	intraveno us		⊖								
						drugAdminist ration	\$atcde#B01AE03 "Argatroban"  \$sct#116508003 "Argatroban (substance)"	intraveno us		⊖								
					NoThera peuticAnti coagulati onWTinz aparin	drugAdminist ration	\$atcde#B01AB10 "Tinzaparin"  \$sct#412608008 "Tinzaparin (substance)"	subcutan eous	175 IE/kg 1x/d	⊖								
Antithrom bFondap ProphIn- Hospitalis edCOVID 19 PatientsR ecommPI an	Antithrombotic prophylaxis with Fondaparinux in hospitalized COVID-19 patients	PopHospitalised  COVID19- PatientsWOVe nous ThrombosisWI THCI	#alll		Antithrom boticProp hylaxisFo ndaparin uxSubcut aneous	drugAdminist ration	\$atcde#B01AX05 "Fondaparinux"  \$sct#708189008 "Fondaparinux (substance)"		=2.5 'mg'/day	⊕								
					Therapeu ticAnticoa gulationF ondapari nux	drugAdminist ration	\$atcde#B01AX05 "Fondaparinux"  \$sct#708189008 "Fondaparinux (substance)"	subcutan eous	<table><tr><th>Weight (kg)</th><th>Dose (1x/d)</th></tr><tr><td>&lt; 50</td><td>5 mg</td></tr><tr><td>&gt;= 50, &lt;= 100</td><td>7.5 mg</td></tr><tr><td>&gt; 100</td><td>10 mg</td></tr></table>	Weight (kg)	Dose (1x/d)	< 50	5 mg	>= 50, <= 100	7.5 mg	> 100	10 mg	⊖
Weight (kg)	Dose (1x/d)																	
< 50	5 mg																	
>= 50, <= 100	7.5 mg																	
> 100	10 mg																	