

# SUPPLEMENTAL MATERIAL ON:

## Periprocedural intravenous heparin during endovascular treatment for ischemic stroke: results from the MR CLEAN

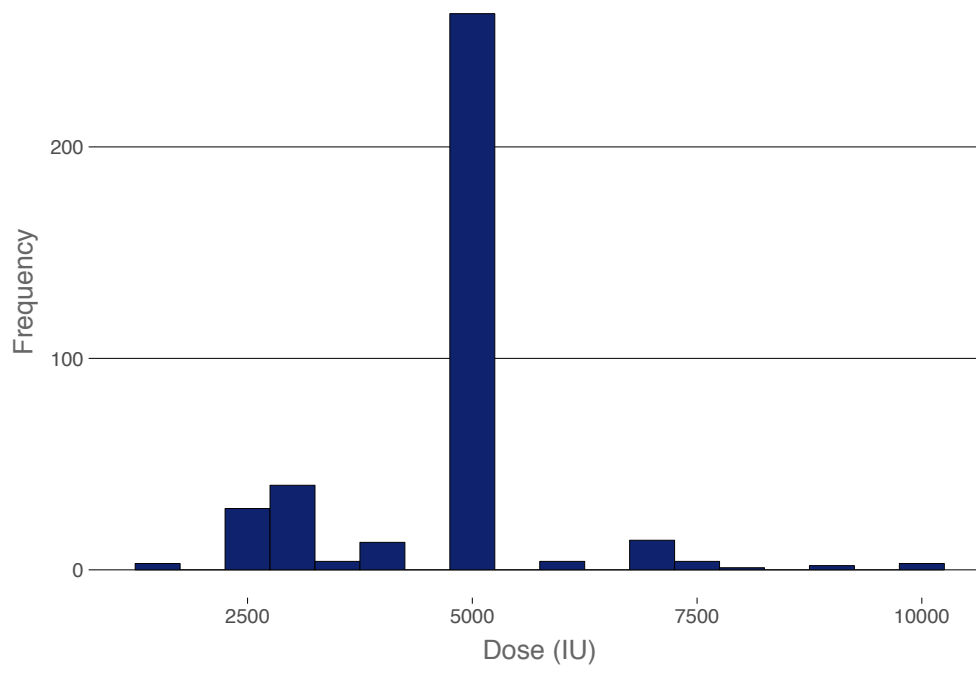
### Registry

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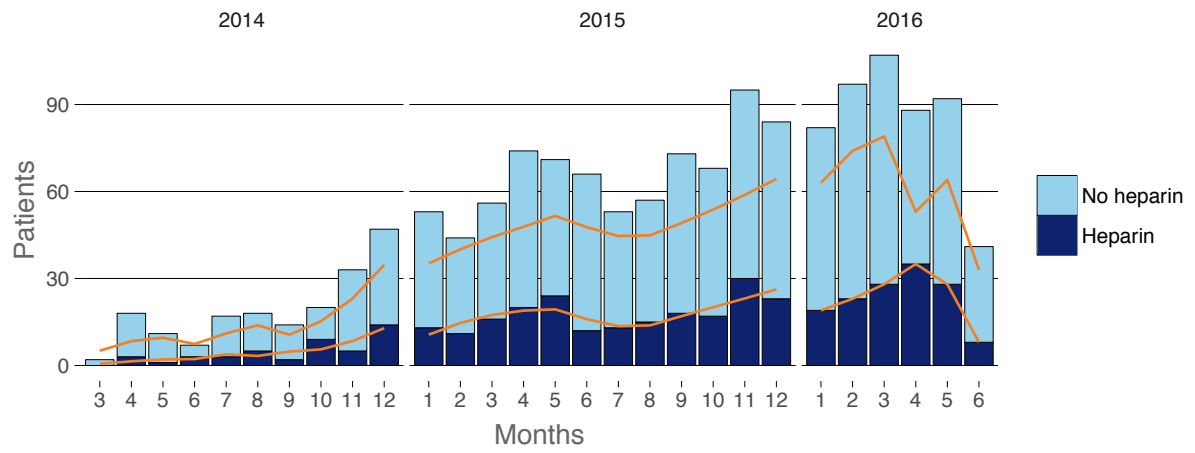
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1 **Supplemental figure I.** Distribution of doses (IU) heparin administered  
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1 **Supplemental figure II.** Heparin use over time in Dutch stroke intervention centers (per year  
2 and month)



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1 **Supplemental table I.** Sensitivity analysis of assumed no heparin vs. explicitly registered as  
 2 no heparin

	Explicitly registered as no heparin (n=98)	Assumed no heparin (n=992)	P-value
<i>Common patient characteristics</i>			
Age	65 (14)	69 (14)	0.01
Male sex	58 (59%)	530 (53%)	0.32
NIHSS at baseline	15 [11, 18]	16 [11, 20]	0.06
Ischemia in left hemisphere	57 (58%)	506 (52%)	0.25
Systolic blood pressure	152 (26)	149 (24)	0.38
Diastolic blood pressure	83 (19)	82 (16)	0.46
IV alteplase	78 (80%)	783 (79%)	1.00
INR	1.2 (0.4)	1.2 (0.4)	0.53
Trombocyte count	251 (91)	251 (93)	0.95
<i>Medical history</i>			
Previous stroke	15 (15%)	168 (17%)	0.76
Atrial fibrillation	18 (18%)	231 (24%)	0.29
Hypertension	50 (51%)	510 (52%)	0.91
Diabetes mellitus	16 (16%)	182 (18%)	0.70
Myocardial infarction	13 (13%)	156 (16%)	0.60
Peripheral arterial disease	2 (2.1%)	94 (10%)	0.02
Pre-stroke mRS >2	8 (8.2%)	106 (11%)	0.53
<i>Medication use</i>			
Antiplatelet	28 (29%)	325 (33%)	0.44
DOAC	4 (4.1%)	28 (2.9%)	0.73
Coumarin	8 (8.2%)	143 (15%)	0.11
Blood pressure lowering medication	46 (47%)	522 (54%)	0.27
Statin	35 (36%)	344 (36%)	0.96
<i>Imaging</i>			
Occluded segment			0.86
Intracranial ICA	7 (7.4%)	47 (5.0%)	
ICA-T	20 (21%)	225 (24%)	
M1	55 (59%)	544 (58%)	
M2	11 (12%)	112 (12%)	
Other (e.g., M3, ACA)	1 (1.1%)	13 (1.4%)	
Reperfusion before intervention (eTICI)			0.15
0	76 (84%)	723 (81%)	
1	8 (8.9%)	48 (5.4%)	
2A	4 (4.4%)	27 (3.0%)	
2B	1 (1.1%)	27 (3.0%)	
2C	0 (0%)	16 (1.8%)	
3	1 (1.1%)	48 (5.4%)	
ASPECTS	8 [7, 10]	9 [7, 10]	0.09
ASPECTS ≤ 7	38 (41%)	286 (30%)	0.05
Collaterals			0.12
Grade 0 - Absent collaterals	4 (4.3%)	66 (7.2%)	
Grade 1 - Occluded area filling <50%	27 (29%)	312 (34%)	
Grade 2 - Occluded area filling >50% but <100%	33 (35%)	345 (38%)	
Grade 3 - Occluded area filling 100%	29 (31%)	192 (21%)	
<i>Workflow (in minutes)</i>			
Time from symptom onset to IV alteplase	26 [21, 30]	24 [18, 31]	0.35
Time from symptom onset to admission ER (intervention center)	144 [67, 185]	134 [58, 189]	0.28
Time from admission ER to groin puncture	62 [40, 94]	66 [38, 100]	0.70
Duration procedure	72 [50, 98]	60 [39, 85]	<0.01
Time from symptom onset to reperfusion	272 [226, 334]	264 [212, 326]	0.25
<i>Procedural</i>			
General anesthetic management	18 (20%)	146 (16%)	0.46
Intra-arterial thrombolysis	5 (5.1%)	15 (1.5%)	0.03
<i>Summary:</i> Baseline demographics with heparin vs. no heparin. Continuous data are presented as mean (SD) for normal distributed data or as median [IQR] for skewed data. Categorical data are presented as numbers (%).			
<i>Abbreviations:</i> ACA, anterior cerebral artery; ASPECTS, Alberta stroke program early CT score; DOAC, direct oral anticoagulant; ER, emergency room; eTICI, extended thrombolysis in cerebral infarction including a 2C grade; ICA (T), internal carotid artery (terminus); IV, intravenous; M(segment), middle cerebral artery; mRS, modified Rankin Scale; NIHSS, National Institutes of Health Stroke Scale			

1 **Supplemental table II.** Complete case analysis of the primary and secondary outcomes in  
 2 patients explicitly registered as treated with heparin vs. no heparin.

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	<b>Heparin (n=398)</b>	<b>No heparin (n=98)</b>	<b>P- value</b>	<b>(c)OR, (95% CI)</b>	<b>a(c)OR, (95% CI)*</b>
<i>Primary outcome</i>					
mRS at 90 days	3 [2, 6]	3 [2, 5]	0.77	1.06 (0.71-1.57)	1.51 (0.73-3.11)
<i>Secondary outcomes</i>					
mRS ≤ 2 at 90 days	144 (41%)	30 (33%)	0.10	1.39 (0.85-2.26)	2.21 (0.82-5.97)
Reperfusion after intervention (eTICI ≥ 2B)	245 (62%)	53 (55%)	0.25	1.33 (0.85-2.09)	1.28 (0.52-3.17)
Symptomatic intracranial hemorrhage	25 (6.3%)	1 (1.0%)	0.07	6.50 (0.87-48.58)	1.83 (0.19-17.31)†
Mortality at 90 days	105 (30%)	19 (21%)	0.13	0.70 (0.25-2.02)	0.70 (0.25-2.02)
<p><i>Summary:</i> Complete case analysis of the primary and secondary outcomes in patients explicitly registered as treated with heparin vs. no heparin. Continuous data are presented as median [IQR] for skewed data. Categorical data are presented as numbers (%).</p> <p><i>Abbreviations:</i> a(c)OR, adjusted (common) odds ratio; CI, confidence interval; eTICI, extended thrombolysis in cerebral infarction including a 2C grade; mRS, modified Rankin Scale</p> <p><i>*Variables in the model:</i> (fixed effects) percentage heparin use per 10%, age, sex, NIHSS at admission, pre-stroke mRS, intravenous alteplase, pre-interventional eTICI score, antiplatelet use, direct oral anticoagulant use, coumarin use, previous stroke, diabetes mellitus, intra-arterial thrombolysis, glucose at baseline, systolic blood pressure, anesthesia type, occlusion segment, ASPECTS at baseline, INR, onset to reperfusion, collateral grading, time per month    (random effect) center</p> <p>† Direct oral anticoagulant use and coumarin use not in model due to lack of convergence</p>					