



## Pharmacologic Versus Mechanical Prophylaxis for Venous Thromboembolism in Patients with Spontaneous Intracerebral Hemorrhage.

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### Introduction

The use of pharmacologic prophylaxis (PP) for venous thromboembolism (VTE) in patients with spontaneous intracerebral hemorrhage (ICH) remains controversial. We hypothesized that PP is associated with improved outcome without elevated bleeding risk when compared to mechanical prophylaxis (MP) alone.

### Methods

We conducted a prospective, observational study on patients >18 years admitted with ICH between 7/2008 and 11/2011. All patients received compression boots for MP at admission. PP utilization (heparin or enoxaparin) was under unit protocol at the discretion of the intensivist and neurosurgery team. Major hemorrhage complications including ICH expansion and new intracranial bleeding were recorded. VTE was diagnosed by ultrasound or chest CT angiogram. Multivariable logistic regression analysis was performed to assess independent predictors for a Modified Rankin Scale (mRS) 4-6 at 3 months follow-up.

### Results

125 patients were included in the analysis; 91 (73%) patients received PP and 34 (27%) patients received MP. Median days to receiving PP was 5 (interquartile range: 3,7) post-bleed and 3 (2,6) post-surgery. Baseline characteristics were similar between groups, including age, admission NIHSS, GCS, APACHE2 (Acute Physiology and Chronic Health Evaluation2), ICH volume, ICH score, and history of prior VTE. More patients in the PP group vs. the MP group underwent ventriculostomy placement (41% vs. 12%, p=0.005) and surgery (28% vs. 9%, p=0.03). The rate of VTE (p=0.7) and major hemorrhage (p=0.3) were similar between groups. At 3 month follow-up, 26 (77%) MP patients and 56 (62%) PP patients had a mRS4-6. After adjusting for NIHSS, ICH score, and APACHE2, PP was an independent predictor against mRS4-6 (odds ratio: 0.15, 95% confidence interval: 0.03-0.70).

Table 1. Baseline characteristics for ICH patients			
	Compression boots alone (n=34)	Pharmacologic + Compression boots (n=91)	P value
Age	69 (55,76)	61 (48,76)	0.2
Gender (female)	17 (50%)	46 (51%)	0.9
DVT/PE/VTE	3 (9%)	8 (9%)	1.0
Admission NIHSS	10 (5,15)	11 (7,15)	0.7
Admission GCS	10 (4,15)	11 (7,15)	0.3
APACHE2	15 (7,24)	13 (8,17)	0.1
CT head characteristics			
Lobar	17 (50%)	39 (43%)	0.5
IVH	14 (41%)	50 (55%)	0.3
Volume (cc)	42 (5,133)	27 (9,49)	0.08
Midline shift (Y,N)	15 (44%)	33 (36%)	0.5
ICH score	2 (0,4)	2 (1,3)	0.9
EVD	4 (12%)	37 (41%)	<b>0.005*</b>
Surgery	3 (9%)	25 (28%)	<b>0.03*</b>

Table 2. Outcomes for ICH patients			
	Compression boots alone (n=34)	Pharmacologic + Compression boots (n=91)	P value
Bleed Type			
EVD bleed	1 (3%)	4 (4%)	0.7
New ICH	1 (3%)	2 (2%)	0.9
Major Hemorrhage	5 (15%)	21 (23%)	0.3
Thrombosis			
VTE	1 (3%)	4 (4%)	0.7
In-hospital mortality	19 (56%)	18 (20%)	<b>&lt;0.0001*</b>
DNR	16 (47%)	19 (21%)	<b>0.004*</b>
Withdrawal	8 (24%)	10 (11%)	0.08
LOS	5 (2,8)	11 (8,16)	<b>&lt;0.0001*</b>
3 month outcome			
Mortality	25 (74%)	29 (32%)	<b>&lt;0.0001*</b>
mRS 4-6	26 (77%)	56 (62%)	0.1

Table 3. Multivariable logistic regression analysis for mRS 4-6 at 3 months	
	Logistic regression mRS≥4 at 3 months OR (95% CI)
Admission NIHSS	1.02 (0.80-1.30)
ICH score	<b>2.17 (1.10-4.30)*</b>
APACHE2	<b>1.22 (1.05-1.41)*</b>
Pharmacologic prophylaxis	<b>0.15 (0.03-0.70)*</b>
	C-statistic = <b>0.88*</b>

### Conclusions

In spontaneous ICH patients, pharmacologic prophylaxis for VTE compared to mechanical prophylaxis alone was associated with improved 3-month functional outcomes without an increased risk of major hemorrhage complications.

### Learning Objectives

By the conclusion of this session participants should be able to:

1. Describe the risks and benefits associated with pharmacologic prophylaxis versus mechanical prophylaxis for venous thromboembolism in patients with spontaneous intracerebral hemorrhage.
2. Discuss in small groups how patient selection affects the utilization of pharmacologic prophylaxis versus mechanical prophylaxis for VTE in patients with spontaneous intracerebral hemorrhage.
3. Identify selection criteria for the use of pharmacologic prophylaxis in patients with spontaneous intracerebral hemorrhage.

### References

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