

## Do Pre-Printed Forms Help in Thromboprophylaxis in Hospitalized Patients?

### Introduction

Deep venous thrombosis (DVT) and pulmonary embolism (PE) are the most common manifestation of venous thromboembolism and the most preventable cause of in-hospital mortality.

In 1856 Rudolf Virchow identified three key elements that lead to DVT. Now known as the Virchow's Triad, these include:

- Venous stasis
- Vascular/vessel wall injury
- Hypercoagulability

Hospitalized patients exhibiting any two of these factors are predisposed to clot formation.

### Research Question

Does the systematic use of pre-printed forms increase the use of DVT prophylaxis?

### Methods

For this study the charts of 250 patients, ages 18 years and older, were randomly selected and reviewed from two hospital services (A and B) that admit and manage patients in the hospital. Service A used handwritten orders but a very small percentage used pre-printed DVT prophylaxis forms. At the time of the study service B almost always used a pre-printed DVT prophylaxis form. All admission history and physical records were screened and reviewed to determine the following:

1. Whether the standard DVT order form was used
2. Whether DVT prophylaxis was considered
3. If considered, what type of prophylaxis

The patients were then grouped according to type of DVT prophylaxis used: (Table 1, Figure 1)

1. Pharmacotherapy: Heparin and/or Coumadin

2. Mechanical: Intermittent pneumatic compression stocking (IPCs) and graded compression stocking (GCS)
3. Pharmacotherapy and Mechanical methods utilized

### Service A / 250 patients:

Pharmacotherapy: 81

Mechanical IPC or GCS: 5

IPC or GCS indicated but not used: 63

Pharmacotherapy plus mechanical: 78

Excluded: 23

### Service B / 250 patients:

Pharmacotherapy: 112

Pharmacotherapy plus mechanical: 73

Mechanical alone: 1

Indicated but not used: 33

Excluded: 31

### Discussion

Service A, who used hand written orders, missed appropriate DVT prophylaxis 63 times out of 250 or 25.2%. Service B, who routinely used pre-printed for DVT prophylaxis, failed to order it in 33 out of 250 patients, or 13.2%. There was no statistical difference when Service A and Service B were evaluated versus DVT prophylaxis ( $P < .076$ ). (Table 2)

However, when outcomes were compared between patients whose charts had the pre-printed DVT prophylaxis form and those who did not, the difference is statistically significant ( $P = .001$ ). (Tables 3-5)

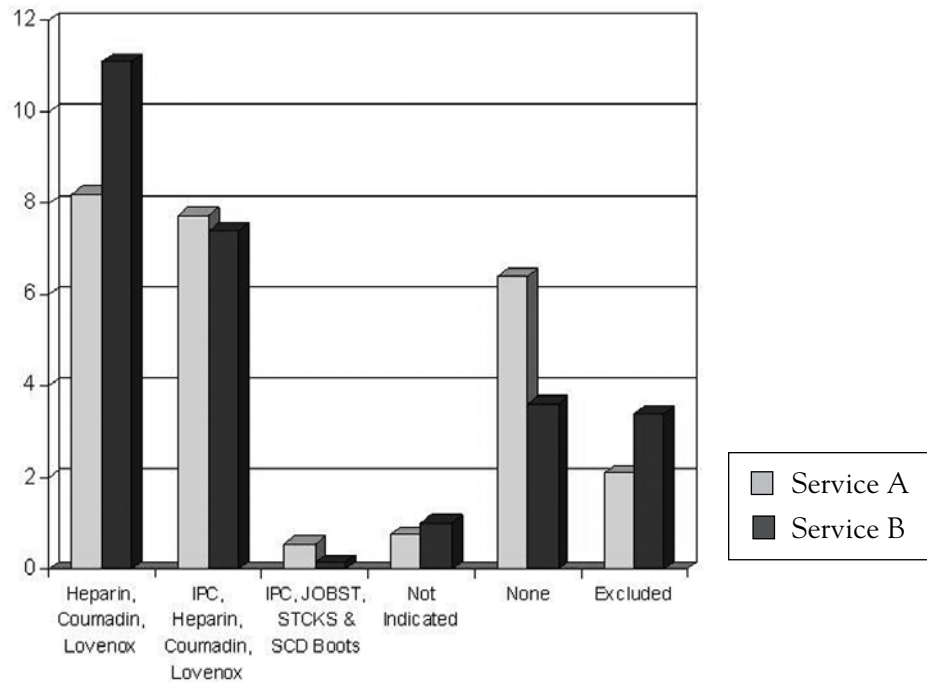
### Conclusion

Pre-printed forms that assess the need for DVT prophylaxis make an important difference in implementing appropriate treatment. When pre-printed forms were used in this study, the chance of missing appropriate DVT prophylaxis was reduced by approximately one half (25.2% to 13.2%  $P = .001$ ).

**Table 1. Comparison of Both Services for DVT Prophylaxis Implementation**

		Medicode						
		Heparin, Coumadin, Lovenox	IPC and heparin, Coumadin, Lovenox	IPC and Jobst stcks and SCD boots	Not Indicated	None	Excluded	Total
<b>Service A</b>	Count	81	78	5	6	63	17	250
		32.4%	31.2%	2.0%	2.4%	25.2%	6.8%	100.0%
	% w/in Medicode	42.0%	51.7%	83.3%	40.0%	65.6%	43.6%	50.0%
	% of Total	16.2%	15.6%	1.0%	1.2%	12.6%	3.4%	50.0%
<b>Service B</b>	Count	112	73	1	9	33	22	250
	% w/in Service	44.8%	29.2%	0.4%	3.6%	13.2%	8.8%	100.0%
	% w/in Medicode	58.0%	48.3%	16.7%	60.0%	34.4%	56.4%	50.0%
	% of Total	22.4%	14.6%	0.2%	1.8%	6.6%	4.4%	50.0%
<b>Total</b>	Count	193	151	6	15	96	39	500
	% w/in Service	38.6%	30.2%	1.2%	3.0%	19.2%	7.8%	100.0%
	% w/in Medicode	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	38.6%	30.2%	1.2%	3.0%	19.2%	7.8%	100.0%

Figure 1. DVT Prophylaxis Utilization Patterns



**Table 2. Comparison of Both Services Where DVT Prophylaxis Not Implemented**

		Medicode = 5		
		Not Selected	Selected	Total
<b>Service A</b>	Count	187	63	250
	% w/in SERVICE	74.8%	25.2%	100.0%
	% w/in Medicode	46.3%	65.6%	50.0%
	% of Total	37.4%	12.6%	50.0%
<b>Service B</b>	Count	217	33	250
	% w/in SERVICE	86.8%	13.2%	100.0%
	% w/in Medicode	53.7%	34.4%	50.0%
	% of Total	43.4%	6.6%	50.0%
<b>Total</b>	Count	404	96	500
	% w/in SERVICE	80.8%	19.2%	100.0%
	% w/in Medicode	100.0%	100.0%	100.0%
	% of Total	80.8%	19.2%	100.0%

**Table 3. Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Group Miss	500	100.0%	0	0.0%	500	100.0%

**Table 4. Group Miss Crosstabulation**

		Miss		
		Miss	Not Miss	Total
<b>Service A</b>	Count	63	187	250
	% w/in GROUP	25.2%	74.8%	100.0%
	% w/in Miss	65.6%	46.3%	50.0%
	% of Total	12.6%	37.4%	50.0%
<b>Service B</b>	Count	33	217	250
	% w/in GROUP	13.2%	86.8%	100.0%
	% w/in Miss	34.4%	53.7%	50.0%
	% of Total	6.6%	43.4%	50.0%
<b>Total</b>	Count	96	404	500
	% w/in GROUP	19.2%	80.8%	100.0%
	% w/in Miss	100.0%	100.0%	100.0%
	% of Total	19.2%	80.8%	100.0%

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**Table 5. Chi-Square Tests**

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	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	11.603 <sup>b</sup>	1	.001		
Continuity Correction <sup>a</sup>	10.842	1	.001		
Likelihood Ratio	11.764	1	.001		
Fisher's Exact Test				.001	.000
Linear-by-Linear Association	11.580	1	.001		
N of Valid Cases	500				

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<sup>a</sup> Computed only for a 2X2 table

<sup>b</sup> 0 cells (.0%) have expected count less than 5. The minimum expected count is 48.00.

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### **Suggested Reading**

1. Carter CJ. The natural history and epidemiology of acute venous thrombosis. *Prog Cardiovasc Dis* 1994;36(6):439-446.
2. Goldhaber SZ. Prevention of recurrent idiopathic venous thromboembolism. *Circulation* 2004;110(24 Suppl 1):IV20-24.