Venous thromboembolism prophylaxis: A clinical decision support and prescribing tool for electronic medication management

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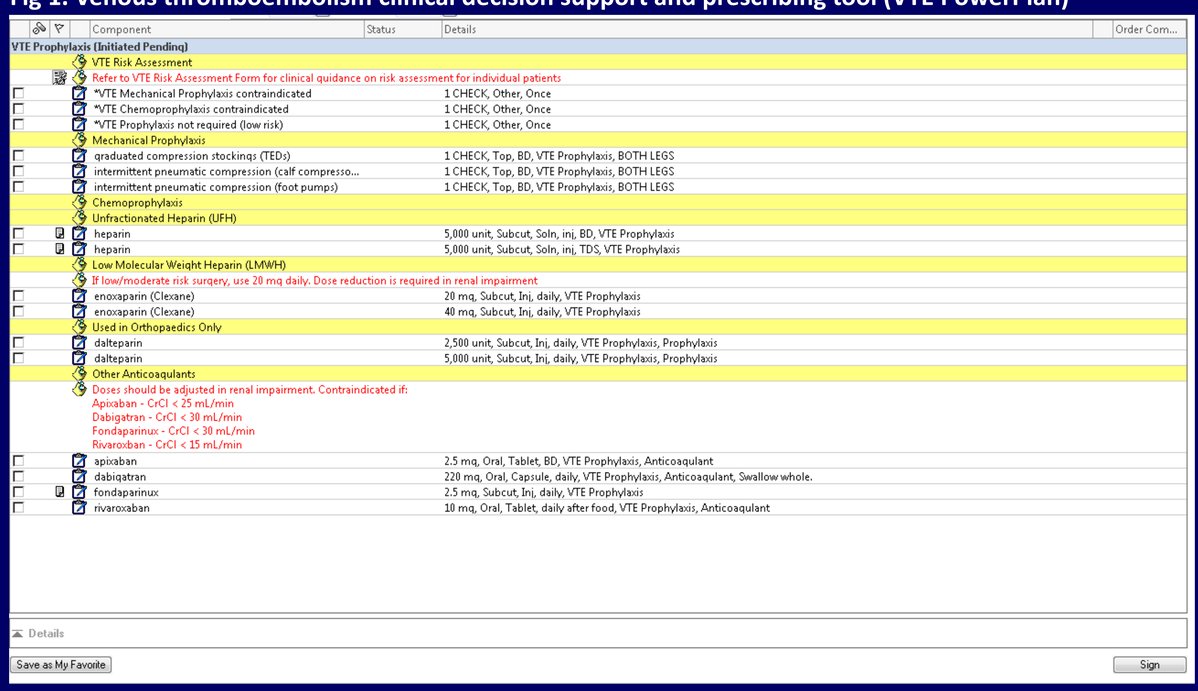
Background

Venous thromboembolism (VTE) is a leading cause of preventable death in Australia however evidence suggests VTE risk assessment and prophylaxis prescribing rates are suboptimal in NSW healthcare facilities.(1) A clinical decision support and prescribing tool for VTE prophylaxis was designed using Cerner™ PowerPlan functionality and built into the electronic medication management system (eMeds) at a Sydney tertiary teaching hospital. The VTE PowerPlan provides a consistent means to document evidence of VTE risk assessment. The NSW Health Adult VTE Risk Assessment Tool (2) may be accessed via the PowerPlan for guidance. Use of the VTE PowerPlan is optional.

Fig 1. Venous thromboembolism clinical decision support and prescribing tool (VTE PowerPlan)



Aims

1. To evaluate the effectiveness of a peer-to-peer promotion and feedback strategy for improving uptake of the VTE PowerPlan, and to assess the effectiveness of the VTE PowerPlan in improving risk-appropriate VTE prophylaxis prescribing.
2. To evaluate the effect of the strategy on VTE risk assessment documentation and prophylaxis prescribing practice, and evaluate user acceptability of the VTE PowerPlan.

Method

- Single-centre, prospective, cross-sectional audit of VTE risk assessment and prescription in hospital inpatients with a pre- and post-intervention phase
- **Intervention strategy:** Nominated Junior Medical Officers (JMO) were trained and instructed to promote the use of the VTE PowerPlan and provide support and eMeds-generated feedback to target colleagues over six weeks.
- **Pre- and post-intervention audits:** The medical record was comprehensively assessed for evidence of patients' VTE risk using a modified version of the NSW Health Adult Venous Thromboembolism Risk Assessment Tool.(2) Appropriateness of VTE prophylaxis was determined by comparison between prophylaxis prescribed and that recommended by the tool.
- **Sample size and recruitment:** Adult inpatients admitted under a surgical or medical team for more than 24 hours were considered for audit. A systematic sampling method was applied to obtain a required sample of 198 patients for both pre- and post-audits.
- **Statistical analysis:** Statistical analysis was performed using either Pearson's chi-squared or Fisher's exact tests of association.
- **User acceptance survey:** A paper-based survey utilising Likert scales and open-ended questions was completed by JMO at the conclusion of the intervention.

Results

- More patients had risk-appropriate prophylaxis prescribed where the VTE PowerPlan was utilised [90% (63/70)] compared with patients where it was not used [71.5% (233/326)] (p=0.001).
- Analysis of pre-intervention (n=198) and post-intervention (n=198) audit data revealed no significant differences in the rates of VTE PowerPlan uptake or risk-appropriate VTE prophylaxis prescribed.
- Documented evidence of VTE risk assessment increased significantly from 51.5% (102/198) to 68.2% (135/198) (p<0.001).
- A total of 49 surveys were distributed and 38.8% (19 of 49) were completed and returned for analysis. Most survey responses were favourable towards the VTE PowerPlan despite limitations.

Table 1. Patient demographic, admission characteristics and clinical variables (n=396)

	Pre-intervention (n = 198)	Post-Intervention (n = 198)	P-value
Median age, *years (interquartile range)*	76.5 (63.3-86)	76.0 (61-84.8)	0.25
Gender			
Male, n (%)	101 (51)	108 (54.6)	0.48
Female, n (%)	97 (49)	90 (45.4)	
Division			
Medical, n (%)	140 (70.7)	136 (68.7)	0.66
Surgical, n (%)	58 (29.3)	62 (31.3)	
VTE risk level			
Low, n (%)	2 (1)	2 (1)	0.33
Medium, n (%)	186 (93.9)	179 (90.4)	
Higher, n (%)	10 (5.1)	17 (8.6)	

Table 2. Effect of the peer-led promotion strategy on VTE PowerPlan use and prescribing practice

	Pre-intervention (n=198)	Post-intervention (n=198)	P-value
VTE PowerPlan used			
Yes, n (%)	28 (14.1)	42 (21.2)	0.065
No, n (%)	170 (85.9)	156 (78.8)	
Risk-appropriate VTE prophylaxis prescribed			
Yes, n (%)	148 (74.7)	148 (74.7)	1.0
No, n (%)	50 (25.3)	50 (25.3)	
Documented evidence of VTE risk assessment evident			
Yes, n (%)	102 (51.5)	135 (68.2)	**<0.001**
No, n (%)	96 (48.5)	63 (31.8)	

Fig 2. User acceptance survey responses relating to ease of use, impact on workflow and clinical value

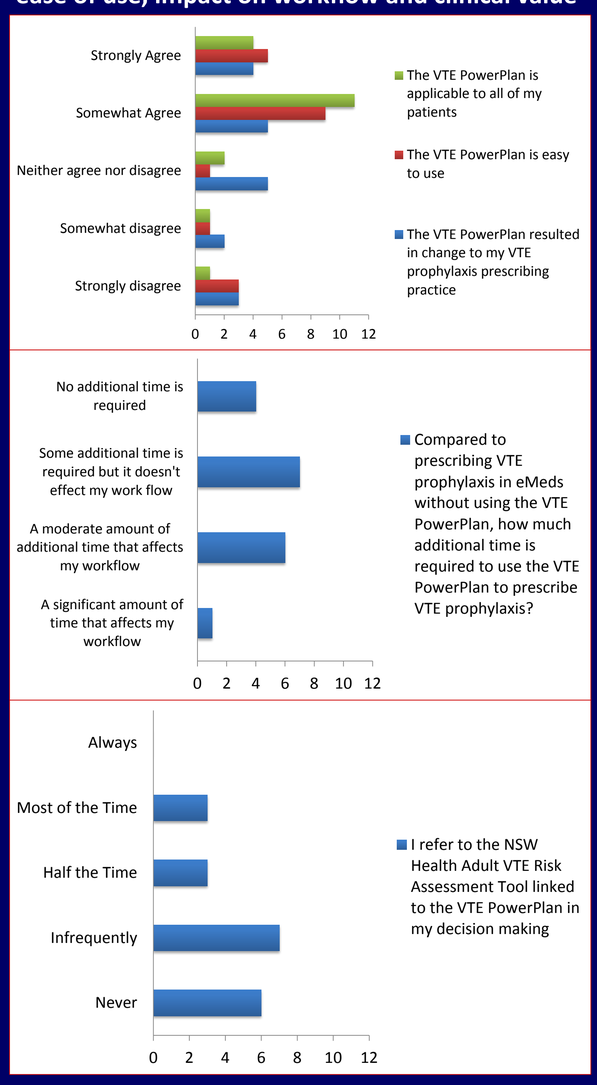


Fig 3. User acceptance survey sample responses categorised by theme

Theme	Comment
Ease of use	***"Not intuitive, should be able to prescribe like you would any medication."*** ***"Too many clicks."*** ***"Maybe use of the tool should be mandatory to ensure all patients have a risk assessment"*** ***"Suggest VTE alert so every patient should be assessed regarding VTE risk on admission"*** ***"The [VTE PowerPlan] should be an option from 'medications' so we can sign off everything at once when we admit a patient"*** ***"Unclear who was on DVT prophylaxis at a glance - suggest a quick visual for example, a home page to indicate whether patient is on DVT prophylaxis or not."***
Time to use	***"The PowerPlan is normally pretty quick."*** ***"Improve the speed at which it loads."*** ***"Takes too long, too many boxes"*** ***"Limit the number of options"*** ***"The PowerPlan takes longer to chart".***
Clinical value	***"The [VTE PowerPlan] should be considered in all patients"*** ***"Maybe use of the tool should be mandatory to ensure all patients have a risk assessment"*** ***"Suggest VTE alert so every patient should be assessed regarding VTE risk on admission"***

Conclusion

The VTE PowerPlan is an acceptable tool that is associated with appropriate VTE prophylaxis prescribing decisions and improvements in risk-assessment documentation rates. Experiences and user-feedback from this study should be considered in future strategies to improve adoption rate of the VTE PowerPlan.

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References

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