Do Risk Factors Change in Medical Patients While Receiving VTE Prophylaxis? A retrospective, cross-sectional study assessing VTE and Bleeding Risk

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Background

- An estimated 75-80% of non-surgical medical patients receive VTE prophylaxis during hospital admission[1,2]
- Current guidelines recommend pharmacological prophylaxis for patients at increased risk of thrombosis and low risk of bleed, and recommend risk stratification through the use of externally validated risk-assessment models (RAMs) such as the IMPROVE models[3]
- Risk factors may change during the course of admission and re-assessment of risk categories represents an opportunity to discontinue unnecessary or unsafe drug therapy

Objectives

- To describe whether risk categories for thrombosis and bleed change during hospital admission to warrant discontinuation of prophylaxis using the IMPROVE VTE and Bleed RAMs, respectively
- **Primary outcome**: the no. of patients who moved from high to low risk of VTE, or who moved from low to high risk of bleed during hospital admission (⟶)
- **Secondary outcomes**: the no. of patients who:
  - Remained at low risk of VTE throughout admission
  - Remained at high risk of bleeding throughout admission
  - Remained or changed to low risk of VTE and continued prophylaxis until discharge
  - Remained or changed to high risk of bleed and continued prophylaxis until discharge

Methods

- **Design:** Cross-sectional, retrospective chart review
- **Population:** Non-surgical medical patients who received prophylactic doses of dalteparin or UFH while admitted in the Fraser Health Authority (FH) between April 1-30, 2017
- **Sample:** Systematic random sampling of 200 patients with proportionate representation from all acute FH sites
- **Sample size calculation:** Convenient sample size of 200 patients calculated to yield a 95% CI of ± 6.7%, assuming a conservative estimate of 50% for the no. of patients whose risk factors changed during admission

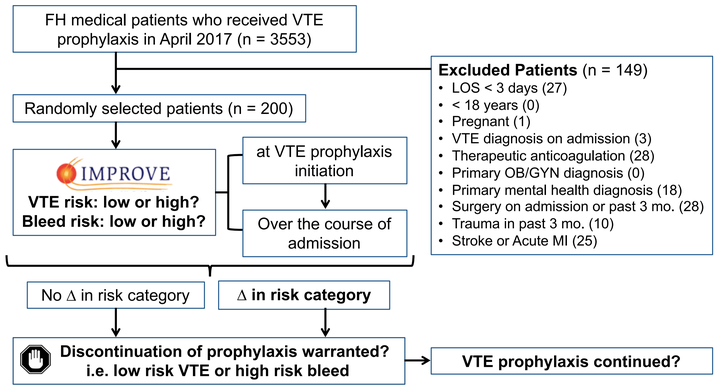

Figure 1: Study Flow Diagram

VTE Risk Factor	Score
Previous VTE	3
Thrombophilia	2
Age > 60 years	1
Active cancer	2
Immobility	1
ICU/CCU stay	1
Lower limb paralysis	2

Total Score	Associated Risk	Category
< 2	< 1%	low risk
≥ 2	≥ 1%	high risk

Bleed Risk Factor	Score
Gastroduodenal ulcer	4.5
Bleeding in prior 3 months	4
Platelets < 50 x 10^9/mL	4
Hepatic failure: INR > 1.5	2.5
GFR 30-59 mL/min	1
GFR < 30 mL/min	2.5
Central venous catheter	2
Rheumatic disease	2
Active cancer	2
Age > 40 years	1.5
Male sex	1

Total Score	Associated Risk	Category
< 7	< 2%	low risk
≥ 7	> 3%	high risk

Table 1: IMPROVE Risk Assessment Models

Male, no. (%)	97 (49)
Age, mean years ± SD	70 ± 16
VTE prophylaxis agent used, no. (%)	
▫ dalteparin	150 (75)
▫ heparin	40 (20)
▫ both dalteparin and heparin used	10 (5.0)
VTE prophylaxis duration, mean days ± SD	10.7 ± 12.4
Length of hospital stay, mean days ± SD	12.5 ± 12.4
IMPROVE VTE score at prophylaxis initiation, mean ± S.D.	1.5 ± 1.1
IMPROVE Bleed score at prophylaxis initiation, mean ± S.D.	4.9 ± 2.2

Table 2: Patient Characteristics (n = 200)

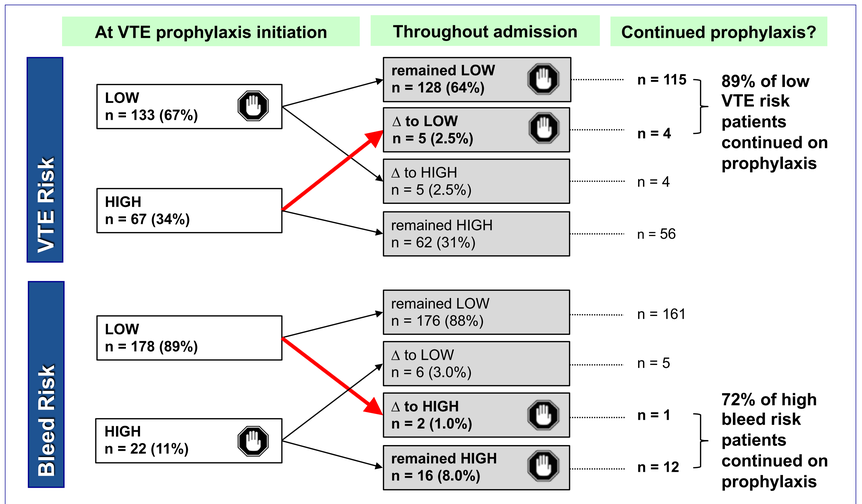

Figure 2: VTE and Bleeding Risk Assessments

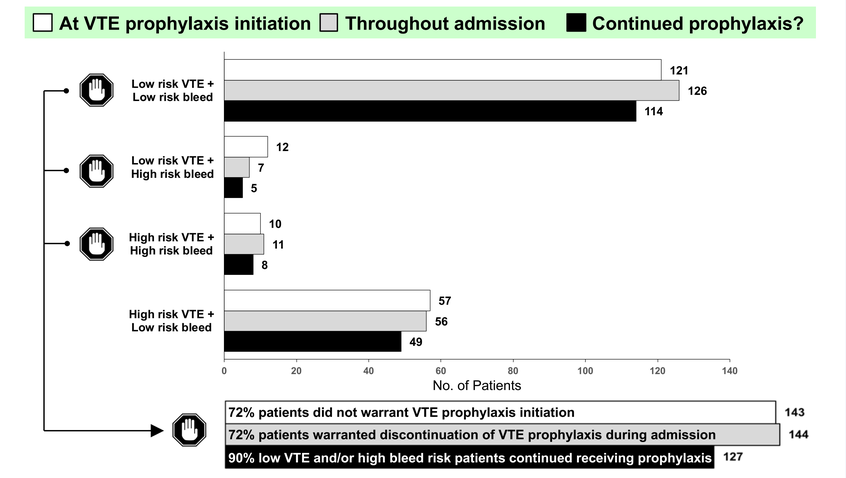

Figure 3: Combined VTE and Bleed Risk Categories Warranting Discontinuation of VTE prophylaxis

Conclusions

- For the majority of patients, VTE and bleed risk categories did not change throughout admission
- The majority of VTE prophylaxis given to medical patients was unnecessary or unsafe and was continued throughout admission
- Future efforts to minimize inappropriate VTE prophylaxis should focus on risk assessment prior to VTE prophylaxis initiation

References:
1. Canadian Patient Safety Institute. Canadian Venous Thromboembolism Audit Recap Report 2014.
2. Rafizadeh R, Turgeon RD, Batterink J, Su V, Lau A. Characterization of Venous Thromboembolism Risk in Medical Inpatients Using Different Clinical Risk Assessment Models. Can J Hosp Pharm. 2016 Nov–Dec;69(6):454–9.
3. Kahn SR, Lim W, Dunn AS, Cushman M, Dentali F, Akl EA, et al. Prevention of VTE in nonsurgical patients: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. Chest. 2012 Feb;141(2 Suppl):e195S – e226S.