Evaluation of a computerized warning system's impact on rate and documentation of venous thromboembolism (VTE) prophylaxis

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ASHP Midyear Clinical Meeting 2009
Student Poster # 5-016

Background

Nearly all hospitalized patients have an increased risk of developing venous thromboembolism (VTE) due to immobility, damage to the venous endothelium, and/or hypercoagulability. Moreover, VTE prophylaxis has shown to reduce morbidity and mortality, improve patient outcomes, and reduce costs. As a result, CMS has set standards that all patients admitted to a hospital should receive VTE prophylaxis or have accompanying documentation as to why no VTE prophylaxis was given. Allegheny General Hospital implemented both an electronic alert and a VTE order-set to improve patient care.

Objective

The objective of the study is to determine if the implementation of an electronic alert and documentation system would increase the rate of VTE prophylaxis or documentation of contraindication.

Methods

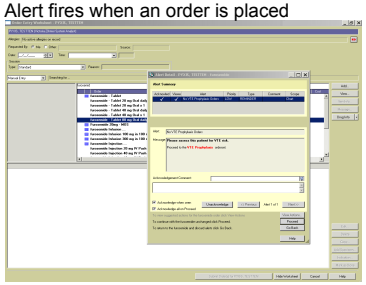
Institutional Review Board exempt review will be obtained because this is a quality assurance drug use evaluation audit and involves research of existing data. Patients were identified, via a report utilizing the electronic medical record. Rates of VTE prophylaxis adherence were analyzed in two phases. Phase I included a three-week period prior to the electronic alert system implementation, while Phase II included a three-week period after the implementation. Patients receiving therapeutic doses of anticoagulation, less than 18 years of age, and whose length of stay was less than 48 hours were excluded. All patients included in the study were evaluated to determine if they received VTE prophylaxis within 24 or 48 hours of their admission. VTE prophylaxis is defined as an order for warfarin, enoxaparin, fondaparinux, heparin, or sequential compression devices (SCDs). For the patients who did not receive VTE prophylaxis within 48 hours of admission, medical records were used to identify if contraindications were documented. The collected data included: patient admit date, discharge date, age, height, weight, serum creatinine, and body mass index; medication(s) name, dose and frequency, and time ordered.

References

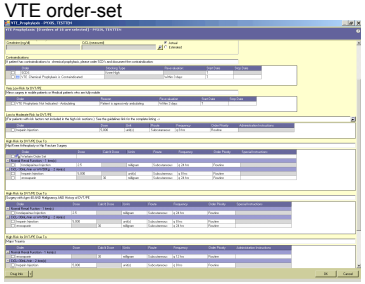
1. Geerts WH, Bergqvist D, Pineo GF. Evidence-Based Clinical Practice Guidelines American College of Chest Physicians Prevention of Venous Thromboembolism: (8th Edition). CHEST 2008; 133:381S–453S
2. Sobieraj DM. Development and implementation of a program to assess medical patients' need for venous thromboembolism prophylaxis. Am J Health-Syst Pharm. 2008; 65:1755-60.
3. Kucher N, Koo Sophia, Quiroz R, et al. Electronic alerts to prevent venous thromboembolism among hospitalized patients. N Engl J Med 2005; 352:969-977.

Alert & Documentation

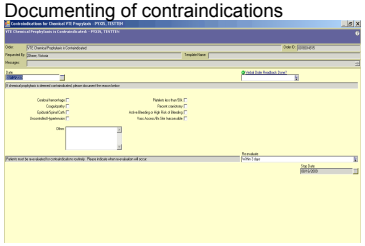
1. Alert fires when an order is placed



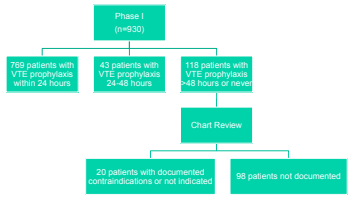
2. VTE order-set

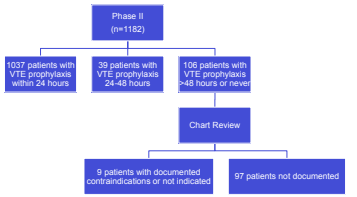


3. Documenting of contraindications

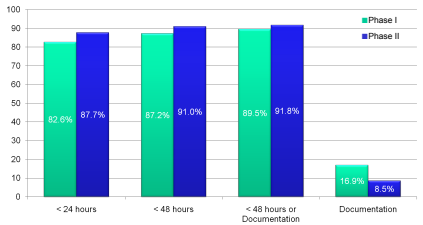


Results





VTE Prophylaxis Prescribing / Documentation



	Phase I (n=930)	Phase II (n=1182)	P value*
VTE Prophylaxis ≤24hrs	769	1037	0.0012
No VTE Prophylaxis ≤24hrs	161	145	
VTE Prophylaxis ≤48hrs	812	1076	0.0068
No VTE Prophylaxis ≤48hrs	118	106	
VTE Prophylaxis or Documentation ≤48hrs	832	1085	0.0694
No VTE Prophylaxis or Documentation ≤48hrs	98	97	

*P value calculated utilizing Fishers' exact test

Conclusion

The initiation of an electronic computerized warning system was associated with a statistically significant increase in VTE prophylaxis at 24 hours and 48 hours. Although not statistically significant, results also showed an increasing trend of either ordering prophylaxis or documenting contraindication within 48 hours. Data collected by the electronic alert system in Phase II showed an 8.4% decrease in rate of documentation when compared to Phase I data collected from patient charts. This decrease may reflect the need for prescriber education in the use and importance of the electronic documentation system. A secondary endpoint to evaluate the adherence of VTE prophylaxis medications to institutional guidelines is still in progress. The objective of this endpoint is to evaluate the appropriateness of medications ordered for VTE prophylaxis. It is apparent from the results that utilization of an electronic alert system improves the number of patients placed on both pharmacologic and mechanical prophylaxis. The study provides further evidence that an alert system and VTE order set improves the quality of patient care.

Disclosures

The following authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

Abby Martin *Nothing to disclose* *Jordan Posey* *Nothing to disclose* *Robert Simpson* *Nothing to disclose* *David Chuirazzi* *Nothing to disclose*
Colleen Hall *Nothing to disclose* *Rachelle Whiteside* *Nothing to disclose* *Edward Seidl* *Nothing to disclose*