5-31-2017

How good are we at determining risk? Quantifying the accuracy of clinician determined risk for VTE prophylaxis

Katerina Dukleska, MD
Thomas Jefferson University

Adam P. Johnson, MD, MPH
Thomas Jefferson University

Tyler M. Bauer
Thomas Jefferson University

Myles Dworkin
Thomas Jefferson University

Johanna Beck
Thomas Jefferson University

See next page for additional authors

Authors

Katerina Dukleska, MD; Adam P. Johnson, MD, MPH; Tyler M. Bauer; Myles Dworkin; Johanna Beck; Kamini D. Patel, RN; Geno J. Merli, MD; and Scott W. Cowan, MD

How good are we at determining risk? Quantifying the accuracy of clinician determined risk for VTE prophylaxis

Katerina Dukleska, MD; Adam P Johnson, MD,MPH; Tyler Bauer; Myles Dworkin; Johanna Beck; Kamini Patel, RN; Geno J. Merli, MD; Scott W. Cowan, MD

Department of Surgery, Thomas Jefferson University Hospitals, Philadelphia, PA

Introduction

- Venous Thromboembolism (VTE), inclusive of deep vein thrombosis (DVT) and pulmonary embolism (PE), is the most common preventable cause of death in hospital admissions.[1]
- Hospital acquired VTE is used as a quality metric, publicly reported and used in value based purchasing models.
- Thomas Jefferson University Hospital (TJUH) uses an electronic medical record (EMR) decision support tool based on a modified Caprini risk assessment model (RAM) to risk stratify patients and to prescribe recommended prophylaxis depending on the risk
- Epic implementation required for development of a new strategy for clinical decision support with VTE risk stratification.

Objectives

- Create and validate a simple tool for concurrent audits of risk stratification, compliance and documentation
- Evaluate accuracy of clinician risk stratification and prophylactic ordering practice compared with a standardized Caprini RAM across different assigned risk categories.
- Provide recommendations for Epic VTE Prophylaxis CDS Development

Methods

- Audit tool was developed in REDCap—a HIPPA compliant, cloud based, data management platform—through review of current standard of care and local expert consensus of best practices
- Institutional data was reviewed to identify three nursing units with the highest rates of VTE.
- Trained medical students performed random concurrent audit of 100 patients across the three units using the previously developed REDCap audit tool, which included chart review or patient/clinician interviews.
- Clinician risk assessment accuracy was determined by an independent application of the Caprini RAM (Figure 1) and recommendations (Table 1).[1]
- The low/very low and high/very high Caprini risk categories were combined in our analysis.

Total Risk Factor Score	Risk Level	Prophylaxis Regimen
0	VERY LOW	❑ Early ambulation
1-2	LOW	❑ Sequential Compression Device (SCD)
3-4	MODERATE	Choose **ONE** of the following medications +/- compression devices: ❑ Sequential Compression Device (SCD) - Optional ❑ Heparin 5000 units SQ TID ❑ Enoxaparin/Lovenox: ❑ 40mg SQ daily (WT < 150kg, CrCl > 30mL/min) ❑ 30mg SQ daily (WT < 150kg, CrCl = 10-29mL/min) ❑ 30mg SQ BID (WT > 150kg, CrCl > 30mL/min) (Please refer to Dosing Guidelines on the back of this form)
5 or more	HIGH	Choose **ONE** of the following medications **PLUS** compression devices: ❑ Sequential Compression Device (SCD) ❑ Heparin 5000 units SQ TID **(Preferred with Epidurals)** ❑ Enoxaparin/Lovenox **(Preferred)**: ❑ 40mg SQ daily (WT < 150kg, CrCl > 30mL/min) ❑ 30mg SQ daily (WT < 150kg, CrCl = 10-29mL/min) ❑ 30mg SQ BID (WT > 150kg, CrCl > 30mL/min) (Please refer to Dosing Guidelines on the back of this form)

Table 1: Caprini RAM recommendations. Published recommendations for prophylaxis regimen according to the score calculated according to the Caprini RAM. For Items included in the Caprini RAM, please see Figure 1 replicated directly from our audit tool.

Results

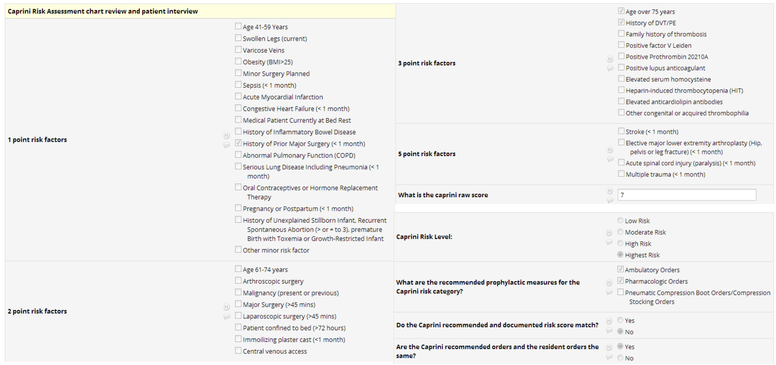

Figure 1: REDCap Audit Tool Independent Caprini RAM factors. Screenshot from audit tool used to capture patient risk factors from chart review and patient interview and calculate the Caprini RAM.

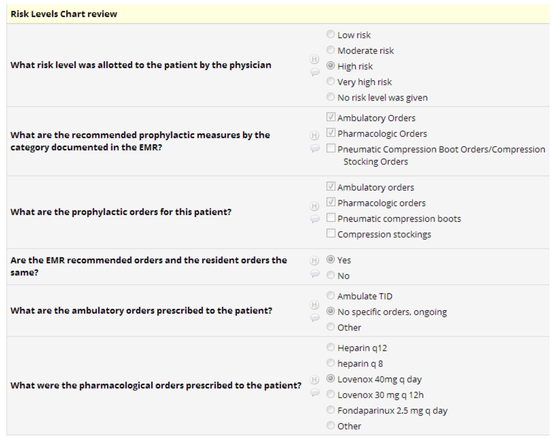

Figure 2: REDCap Audit Tool Questions Related to Clinician Risk Assessment and Ordering of Prophylaxis Options.

Audit Time Requirements for Medical Students

Task	Required time	Purpose
Training for audit tool use	2 hours	Familiarization with EMR, training to obtain consent and to perform interviews.
Data entry requirement (per patient)	20 minutes	Includes chart review, required interviews (i.e., patient, nurse, etc.), and data entry
Project duration	33 hours	100 patient chart reviews were performed, 76% of patients agreed to participate in a bedside interview.

Table 2: Metrics for data collection duration using the DVT audit tool. Time includes duration of training and data entry per patient. Medical students were trained by residents to obtain consent for participation and training for use of EMR.

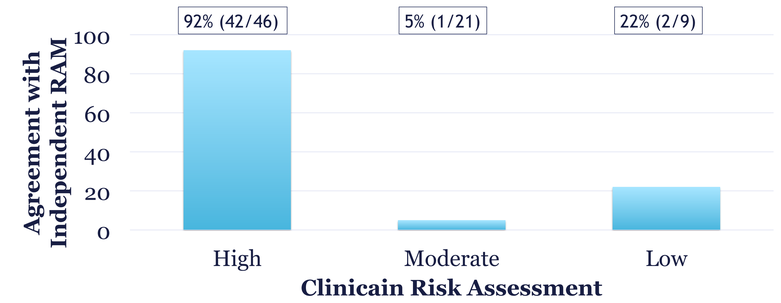

Figure 3: Agreement between Clinician Risk Assessment and Caprini RAM stratified by Clinician Risk Assessment.

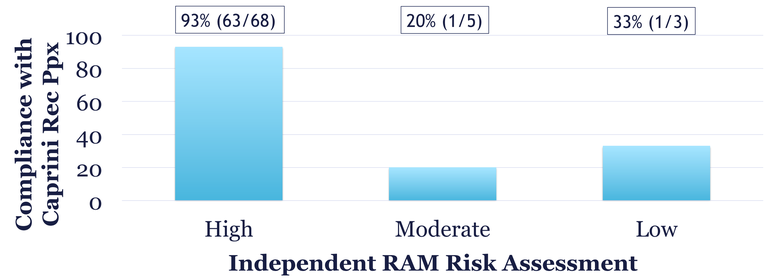

Figure 4: Ordering Compliance with Caprini Recommended Prophylaxis based on independently calculated Caprini RAM.

- One hundred patients were included – 43% were male and 45% were on a surgical service. Seventy six (76%) were able to complete a bedside interview to independently determine their Caprini RAM.
- Clinician assignment of moderate and low risk categories was significantly less accurate than high risk category (Figure 3).
- Patients identified as high risk by independent Caprini RAM were prescribed appropriate VTE prophylaxis 93% of the time, even though they might have been stratified into a moderate/low risk category.

Conclusions and Recommendations

- A simple concurrent audit tool that is HIPAA compliant can be used successfully to perform DVT risk assessment and to assess prescriber prophylaxis compliance in real time.
- The rates of agreement among clinician determined risk and the independently determined Caprini RAM was poor for low and moderate risk.
- CDS must provide clearer criteria and recommendations for moderate and low risk groups that complies with current evidence.
- In spite of incorrect risk stratification, the recommended prophylactic regimen was still ordered, calling into question the benefit or utility of formalized risk stratification.

References

1. Caprini JA. Thrombosis Risk Assessment as a Guide to Quality Patient Care. *Dis. Mon.* 2005;51:70–78. doi:10.1016/j.disamonth.2005.02.003.