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*

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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.
- 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 HIPAA 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).

Results

- The low/very low and high/very high Caprini risk categories were combined in our analysis.
- 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.

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.

<table>
<thead>
<tr>
<th>Total Risk Factor Score</th>
<th>Risk Level</th>
<th>Prophylaxis Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>LOW</td>
<td>Sequential Compression Device (SCD)</td>
</tr>
<tr>
<td>5-11</td>
<td>MODERATE</td>
<td>Sequential Compression Device (SCD) + Sequential Compression Stockings (SCS)</td>
</tr>
<tr>
<td>12-14</td>
<td>HIGH</td>
<td>Sequential Compression Stockings (SCS) + Anticoagulation</td>
</tr>
</tbody>
</table>

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

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

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.

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.
- 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 95% of the time, even though they might have been stratified into a moderate/low risk category.

References


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.