Avoiding Unnecessary Prophylaxis: HMS VTE Low Risk Webinar

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OCTOBER 1, 2018

Agenda

- Overview & Current State
- Hospital Specific Examples
- Discussion

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Overview & Current State

SCOTT FLANDERS, MD

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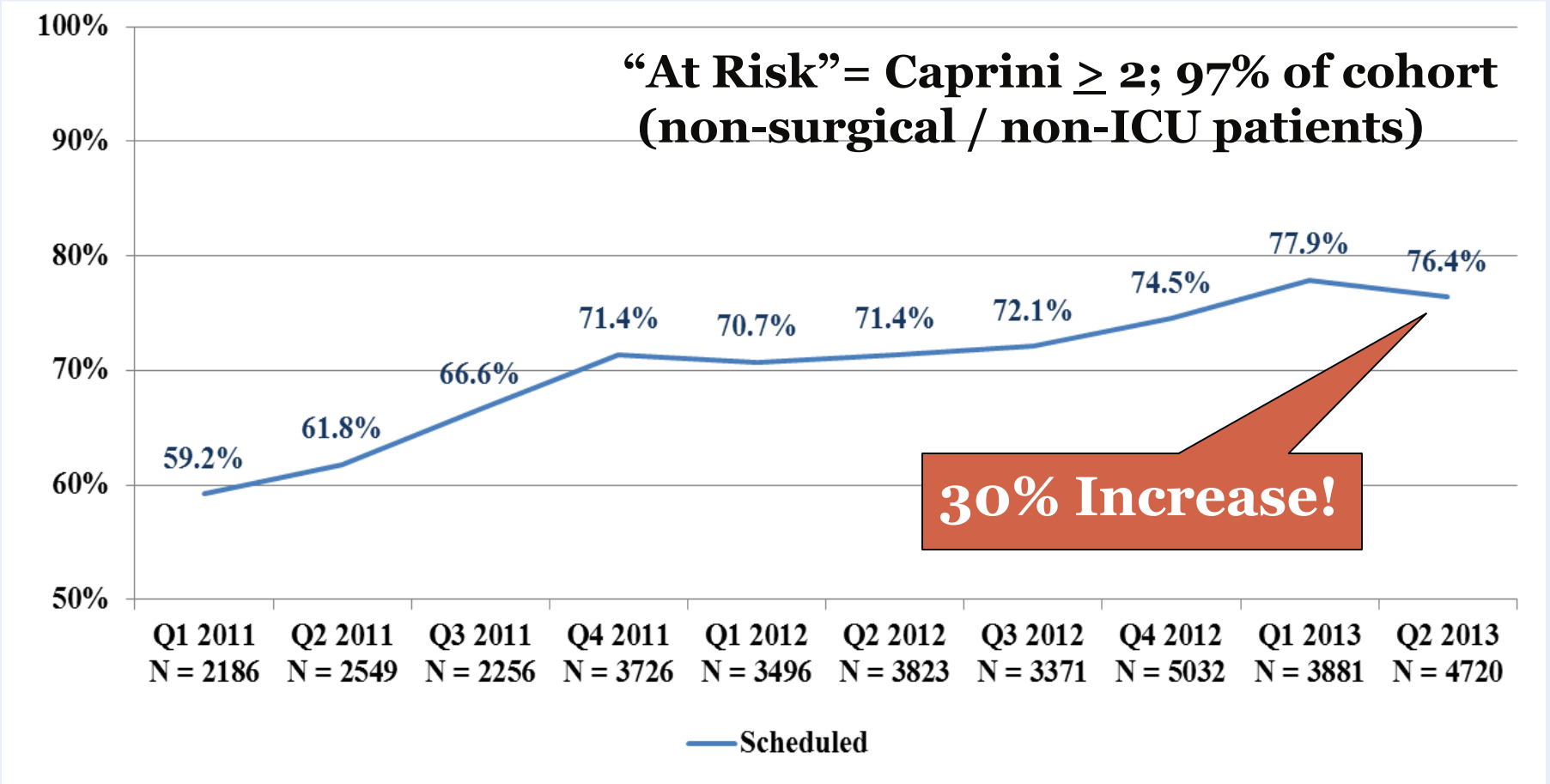
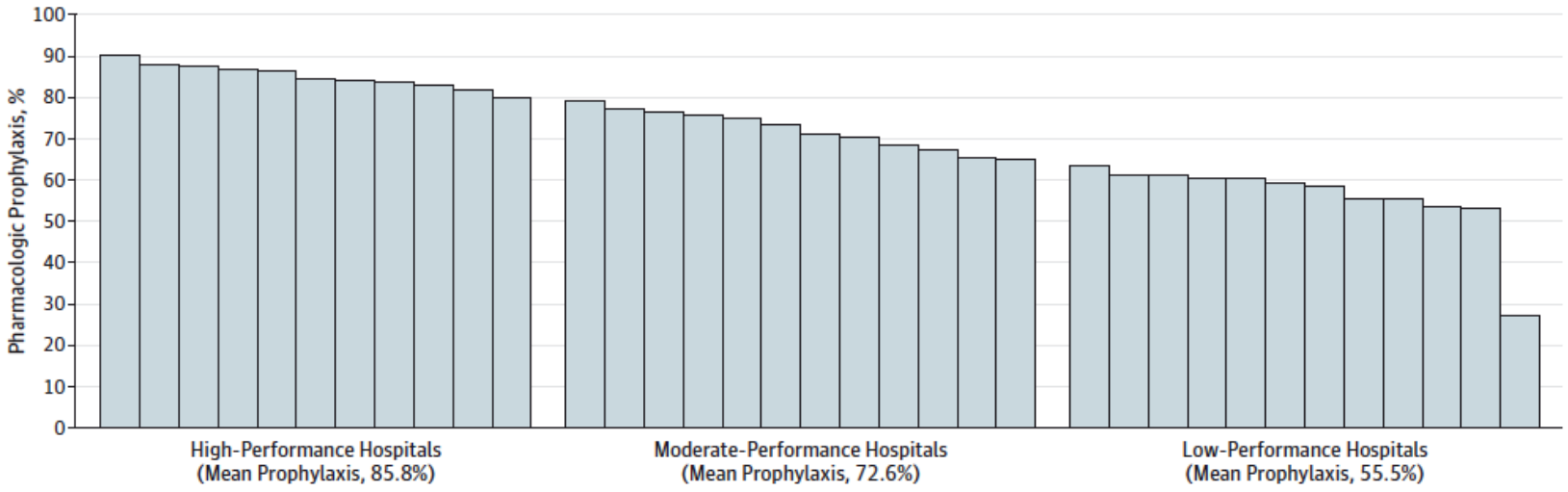
At Risk Patients with No Contraindications: Pharmacologic Prophylaxis on Admission



Do Higher Prophylaxis Rates for ALL Patients Reduce VTE Rates? (n=31,000)

Figure 2. Pharmacologic Prophylaxis on Admission Stratified by Hospital Venous Thromboembolism Prophylaxis Performance in 35 Hospitals

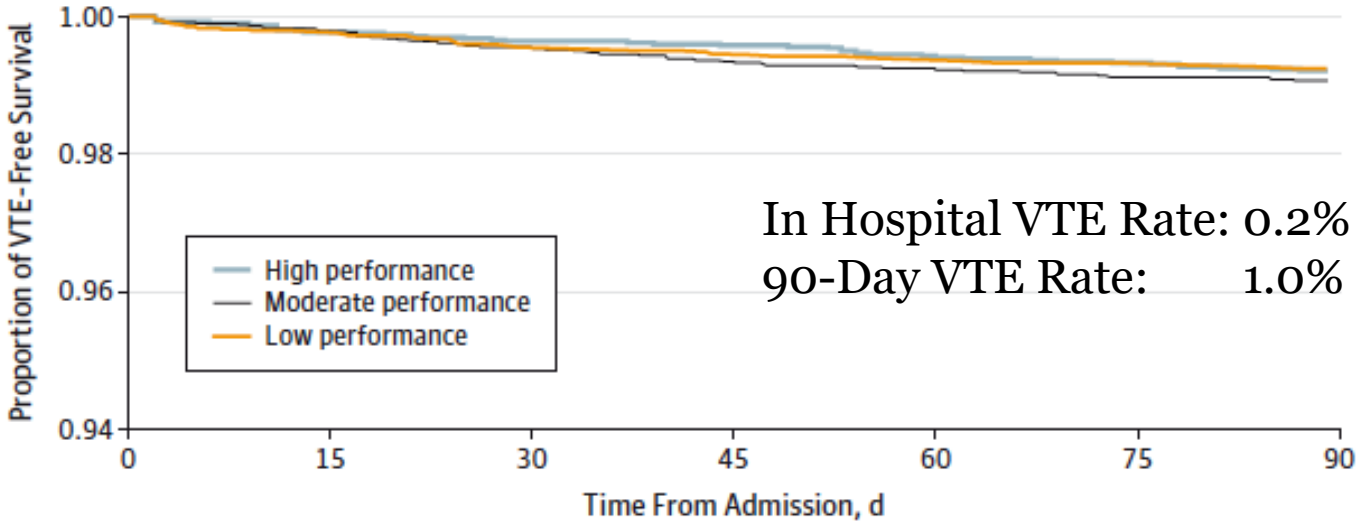


86% **73%** **55%**

Flanders, et. al., JAMA IM. 2014

VTE-Free Survival by Hospital Prophylaxis Performance

Figure 3. Kaplan-Meier Survival Curve Showing Estimates of Venous Thromboembolism (VTE)–Free Survival by Hospital VTE Prophylaxis Performance



In Hospital VTE Rate: 0.2%
90-Day VTE Rate: 1.0%

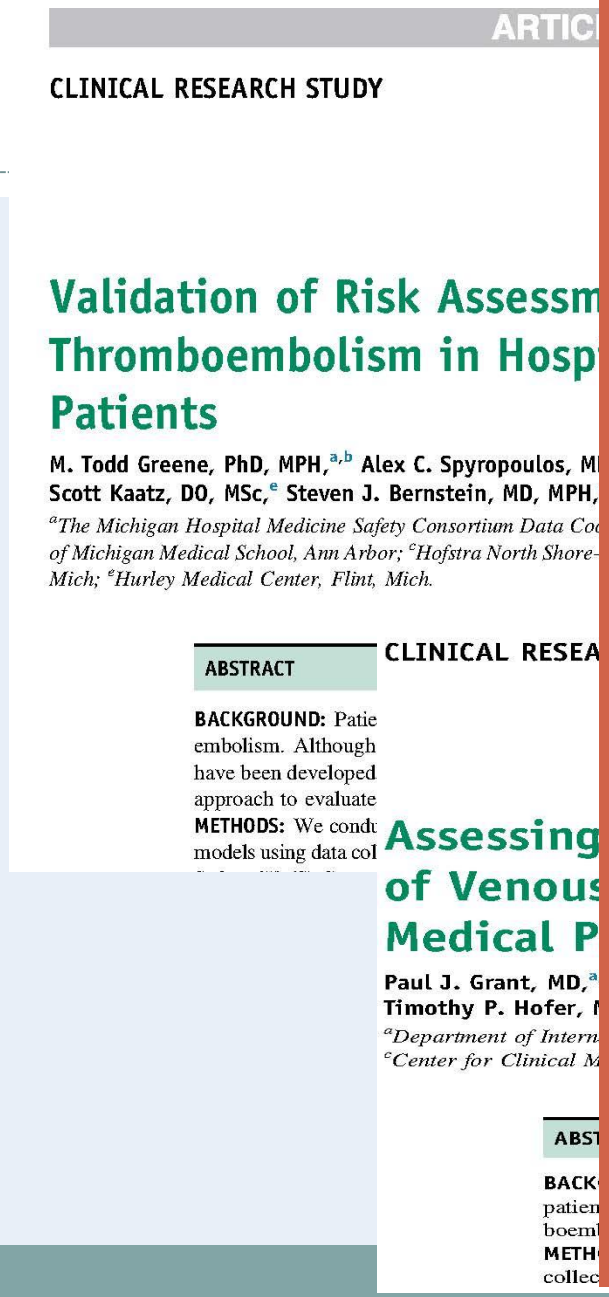
No. (%) at risk							
High performance	5514 (12)	5299 (7)	5220 (3)	5157 (8)	5103 (5)	5072 (24)	5037
Moderate performance	7897 (15)	7623 (19)	7507 (16)	7407 (8)	7338 (9)	7287 (28)	7256
Low performance	7383 (17)	7140 (16)	7032 (6)	6950 (6)	6880 (3)	6841 (24)	6806

Flanders, et. al., JAMA IM. 2014

Why?

- Pharmacologic prophylaxis trials
  - Highly selected patients
  - Average LOS > 7-10 days
  - Treated an average of 10 +/- days
  - Outcomes: screening dopplers for DVT

- Pharmacologic prophylaxis in today's hospitals
  - Applied to all patients
  - Median LOS 4-5 days
  - Mobility enhancement
  - Prophylaxis ends at discharge
  - Outcomes: symptomatic VTE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CLINICAL RESEARCH STUDY

Validation of Risk Assessm
Thromboembolism in Hosp
Patients

M. Todd Greene, PhD, MPH,[a,b] Alex C. Spyropoulos, M
Scott Kaatz, DO, MSc,[e] Steven J. Bernstein, MD, MPH,

[a]The Michigan Hospital Medicine Safety Consortium Data Co
of Michigan Medical School, Ann Arbor; [c]Hofstra North Shore-
Mich; [e]Hurley Medical Center, Flint, Mich.

ABSTRACT

CLINICAL RESEA

BACKGROUND: Patie
embolism. Although
have been developed
approach to evaluate
METHODS: We condu
models using data col

Assessing
of Venous
Medical P

Paul J. Grant, MD,[a]
Timothy P. Hofer,

[a]Department of Intern
[c]Center for Clinical M

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BACK
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Risk Models Evaluated

Kucher
Padua
IMPROVE
Intermountain
Caprini

Bottom Line

- Only 20% of patients were “at risk”
  (non-ICU, non-surgical)
- For all models, VTE rate in “at risk” pts was 3x that in “not at risk” pts
- Very hard to identify population which benefits from prophylaxis
  - NNT 500-750 (ARR < 0.25%)

Low Risk Patients

- Regardless of Risk Score Used
  - Majority of non-surgical, non-ICU medical patients are low risk
  - HMS registry: no benefit of prophylaxis in this group
  - Risks > benefits with pharmacologic prophylaxis
    - Bleeding
    - Patient discomfort
    - Nursing time
    - Cost
  - Mechanical prophylaxis not recommended for low VTE risk patients or high VTE risk patients (without bleeding risk)

A Path Forward for HMS

- Risk assessment is critical
- Pharmacologic Prophylaxis
  - Groups with 90 day risk of VTE $\geq$ 1%
    - Caprini $\geq$ 5
    - Padua $\geq$ 4
- Active bleeding and high VTE risk
  - Mechanical prophylaxis
- "Not at Risk" for VTE
  - No prophylaxis
- Ambulation for everyone!

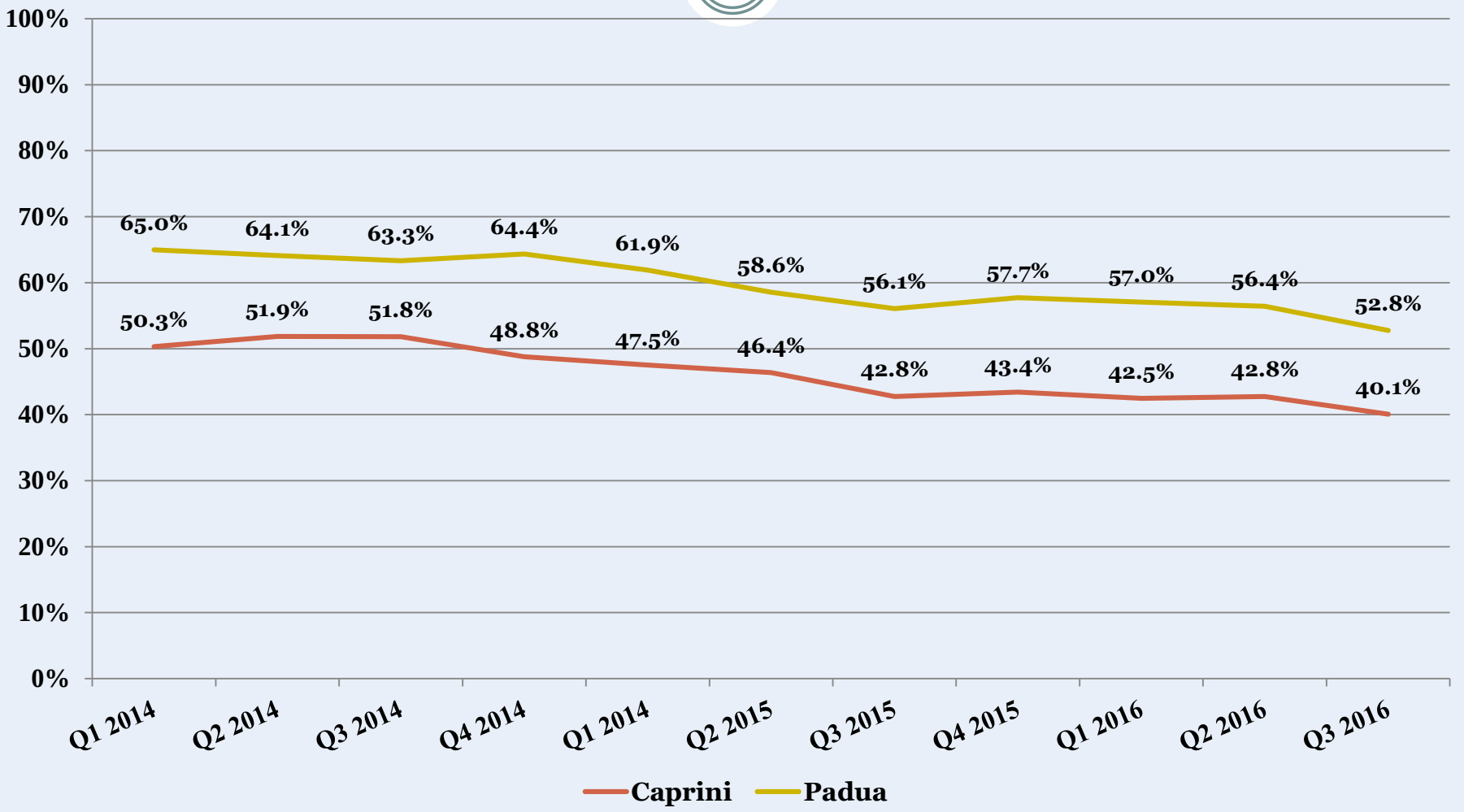
Consistent with National Guidelines

- American College of Chest Physicians (ACCP)
  - 2.4. For acutely ill hospitalized medical patients at **low risk** of thrombosis, we recommend **against** the use of pharmacologic prophylaxis or mechanical prophylaxis (Grade 1B)

- Definition of low risk
  - ACCP: Padua risk score <4
  - HMS: Padua risk score <4 OR Caprini <3 (very low risk)

Kahn SR. Chest. 2012 Feb;141(2 Suppl):e195S-226S. PMID: 22315261

Pharmacologic Prophylaxis Low Risk (p<.0001)



HMS Publication on Excess VTE Prophylaxis in Medical Patients

Research Letter | Less Is More

ONLINE FIRST

May 21, 2018

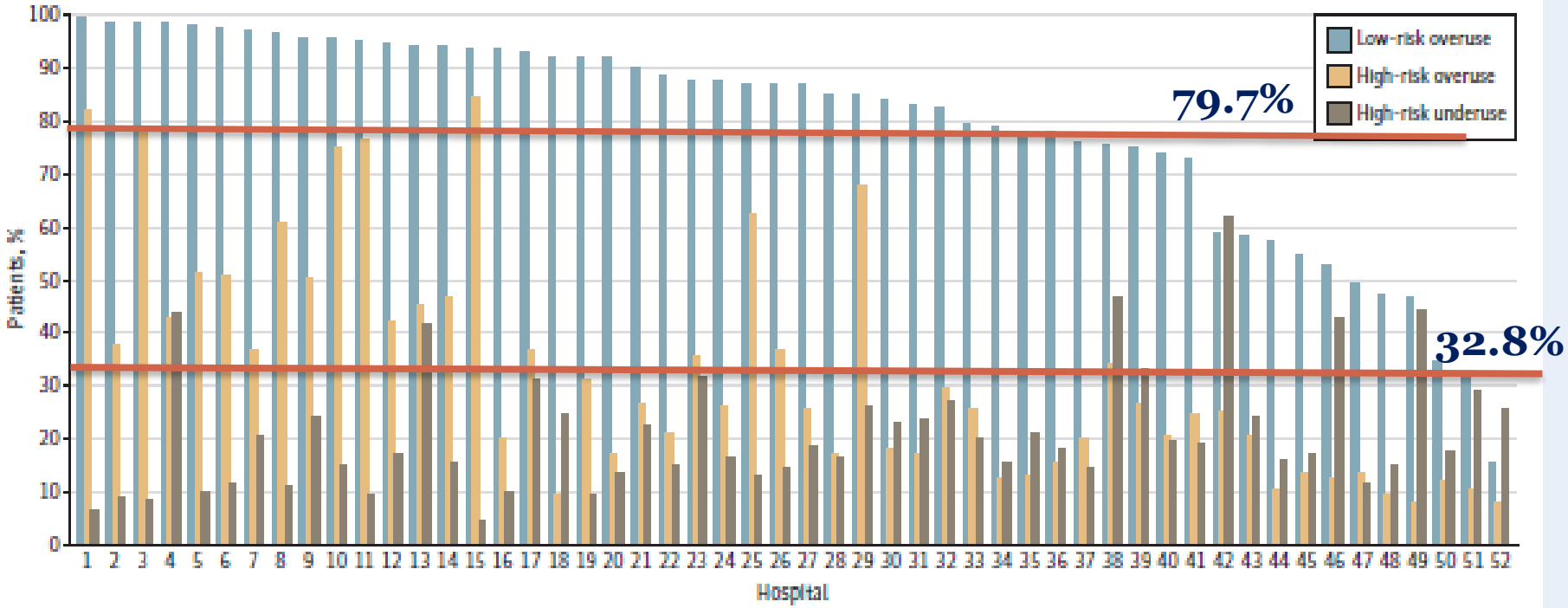
Use of Venous Thromboembolism Prophylaxis in Hospitalized Patients

- Excessive prophylaxis in the low risk population
- Risk stratification between high and low risk is critical

high or low risk. The Michigan Hospital Medicine Safety Consortium (HMS), a statewide quality collaborative aimed at preventing adverse events in hospitalized medical patients, collects detailed data on VTE risk factors, prophylactic treatment, and outcomes. Using data from the HMS,[3] we sought to determine whether patients in this cohort were receiving appropriate VTE prophylaxis.

Excess VTE Prophylaxis

Figure. Excess Use of Venous Thromboembolism Prophylaxis in Low- and High-Risk Patients and Underuse in High-Risk Patients



Padua Prediction Score model[2] used to categorize patients by risk. Mean excess use rate in low-risk patients, 79.7%; mean excess use rate in high risk patients, 32.8%; and mean underuse rate, 21.3%.

Grant, P et al. JAMA Int Med 2018

VTE Pharmacologic Prophylaxis Low Risk Caprini by Hospital 2017-2018

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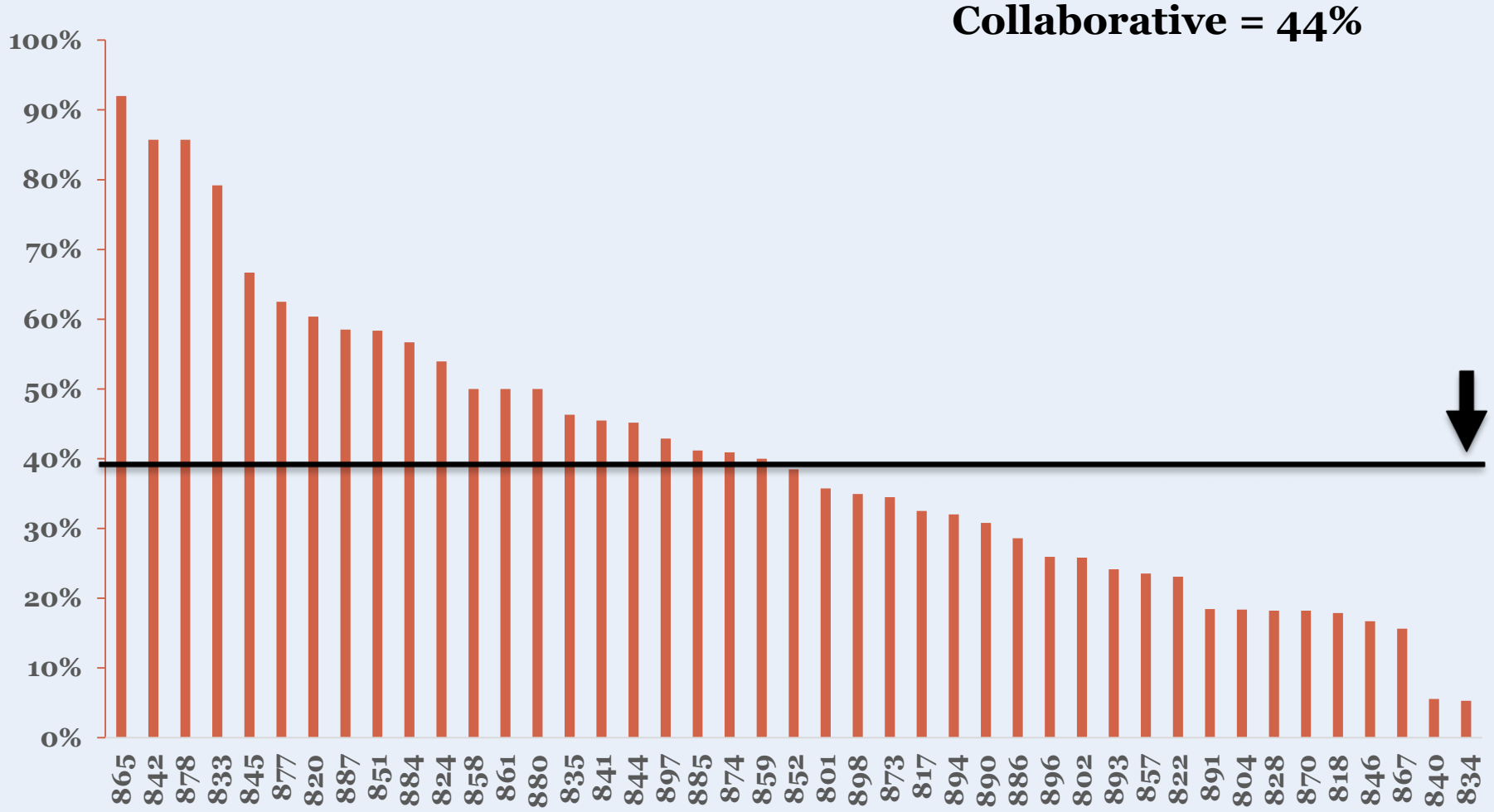

2018 Performance Index – Collaborative Measure

Goal: ≤ 40%

VTE Pharmacologic Prophylaxis Low Risk Caprini by Hospital Quarter 2 2018

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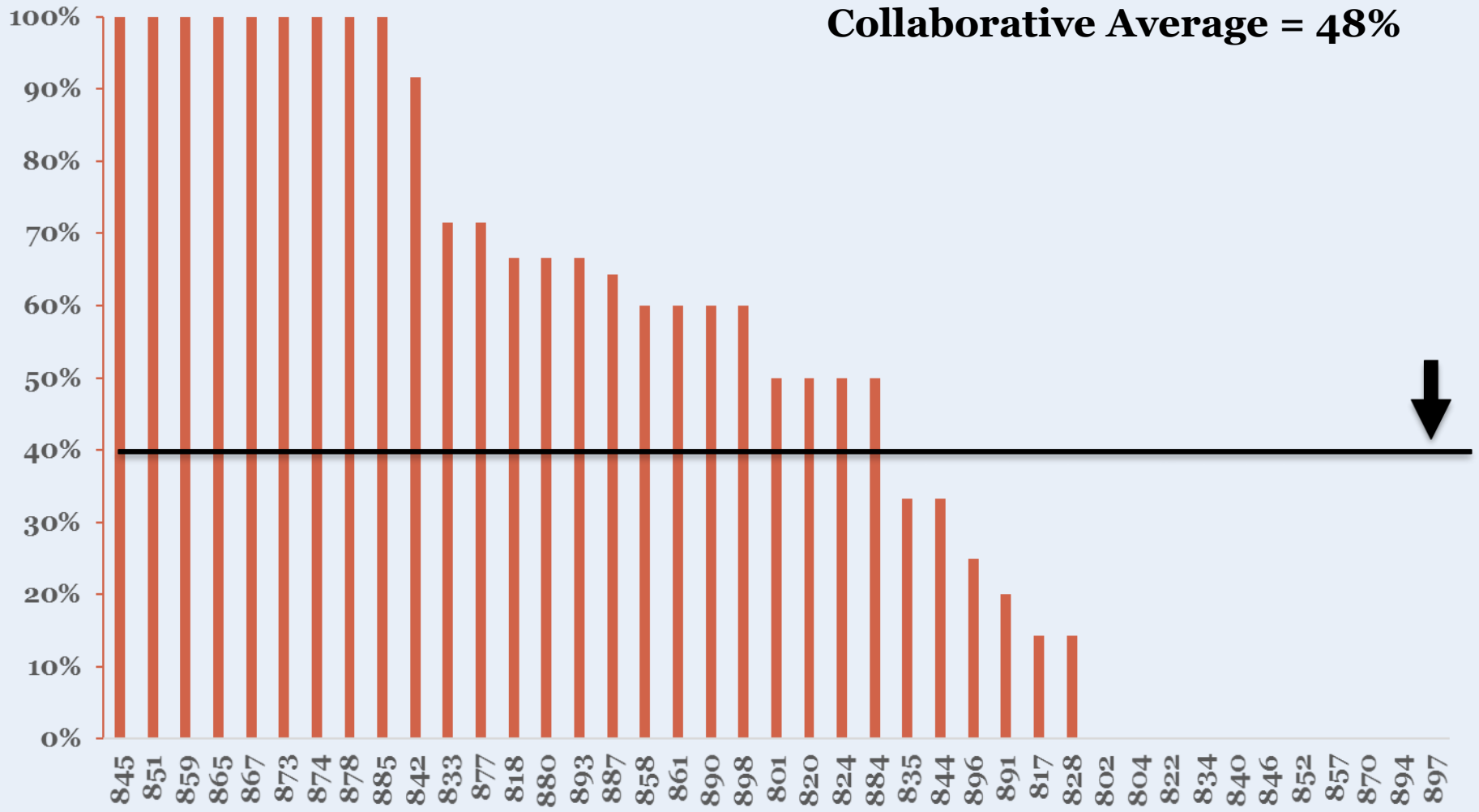


2018 Performance Index – Collaborative Measure

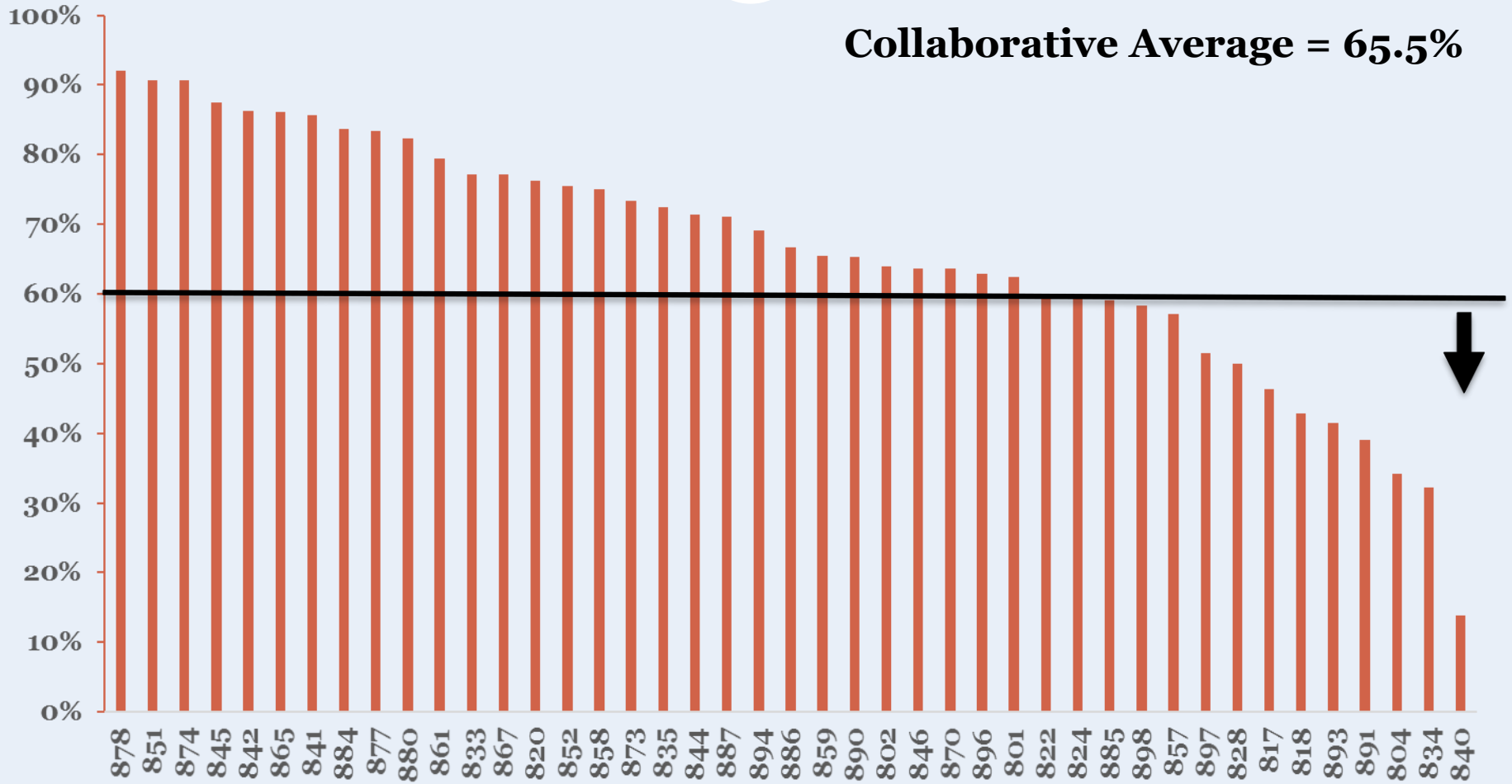
Goal: ≤ 40%

VTE Pharmacologic Prophylaxis Low Risk Caprini by Quarter

2018 Performance Index – Collaborative Measure

Goal: ≤ 40%

VTE Pharmacologic Prophylaxis Low Risk Padua by Hospital Quarter 2 2018



2018 Performance Index – Collaborative Measure

Goal: ≤ 60%

VTE Pharmacologic Prophylaxis Low Risk Padua by Quarter

2018 Performance Index – Collaborative Measure

Goal: ≤ 60%

Hospital Specific Examples

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CHALLENGES WITH OVER-PROPHYLAXIS OF PATIENTS AT LOW RISK FOR VTE

VTE Low Risk Project Interventions

- Our challenge has been inaccurate assignment of patients to moderate/high risk group. If accurately assessed as low risk, the patients typically do not receive orders for pharmacological prophylaxis.
- Added VTE Risk Assessment to Admission Order Set for all medicine patients (2013)
  - Used "3 Bucket" model similar to UC San Diego (Greg Maynard)
  - Strengths:
    - Simple and easy to use; no calculations required
    - Reliable assessment of patients at moderate/high risk for VTE
    - Accepted by medical staff

VTE Low Risk Project Interventions

- Limitations/Barriers:
  - Initially, the threshold for moderate risk was set quite low (≥ 1 VTE risk factors) & very few patients fell into low risk category
  - Most VTE assessments are completed by residents/APPs who tend to be more cautious in assessing low risk & more hesitant to withhold VTE prophylaxis
  - Even if attending hospitalist changes the initial order & discontinues pharmacological prophylaxis upon review, the first dose may have already been given, resulting in a “fallout”

VTE Low Risk Project Interventions

- Implemented revisions to the VTE Risk Assessment to more accurately identify low risk patients (still using 3 bucket model) & increased provider education/feedback
  - Results
    - Started to see improvement in compliance to indicator
    - When VTE project changed to maintenance mode, compliance to this indicator began to decrease again because “sepsis/acute infection” was a risk factor that placed patient in moderate risk category (and VTE cases were associated with ABX project)

VTE Low Risk Project Interventions

- Revised VTE Risk Assessment again to more accurately identify low risk patients (still using 3 bucket model)
  - Risk factors are placed into 2 categories & weighted as high and moderate risk factors
  - Ongoing education is provided to the various groups with multiple methods to try to impact this indicator
  - Have not had sufficient time to assess results of this last change

VTE Risk Assessment in Medical Non-surgical, Non-ICU, Non-paralyzed HFHS Inpatients

A Paradigm Shift in VTE Prophylaxis

Scott Kaatz, DO, MSc,

Division of Hospital Medicine, Henry Ford Hospital

Potential Conflict of Interest for Scott Kaatz

- Consultant
  - Janssen
  - Pfizer
  - Portola
  - Roche
- Research funding (to institution)
  - Janssen
- Board membership (non-profit)
  - AC Forum
  - Thrombosis and Hemostasis Societies of North America
  - National Certification Board of Anticoagulation Providers
  - National Blood Clot Alliance Medical and Scientific Advisory Board

- None in over 12 months
  - Consultant
    - Bristol Myer Squibb
    - Boehringer Ingelheim
    - Daiichi Sankyo
    - The Medicines Company
  - Speaker honorarium
    - Janssen
    - Boehringer-Ingelheim
    - Bristol Myer Squibb
    - Pfizer
    - Daiichi Sankyo
    - CSL Behring

Acknowledgment

- We'd like to collectively thank all the team members on the HFHS VTE taskforce for their efforts on this project.
- VTE Taskforce Members

  Arace, Alicia; Blasses, Cynthia; Bradley, Lisa; Caumartin, Elizabeth; Charara, Abdul-Nasser; Chu, Betty; Cooper, Michelle; Davies, Jennifer; Eichenhorn, Michael; Finch, Kimberly; Humayun, Fawwaz; Jordan, Jack; Kaatz, Scott; Marashi, Seyed Mani; Orta, Mary; Palombit, Margaret; Piotrowski, Megan; Punnoose, Maxin; Reddy, Vikram; Savage, Colleen; Schembri, Sherry; Schweyen, Deborah; Toth, Nicole; Valerio, Cynthia; Walsh, Kathleen; White, Cheryl

Joint Commission VTE Prevention

Hospital Acquired Potentially-Preventable Venous Thromboembolism

- This measure assesses the number of patients diagnosed with confirmed VTE during hospitalization (not present at admission) who
- did not receive VTE prophylaxis between hospital admission and the day before the VTE diagnostic testing order date.

Specifications Manual for National Hospital Inpatient Quality Measures Discharges 07-01-18 (3Q18) through 12-31-18 (4Q18) Version 5.4a

- Explicit documentation that the patient does not need VTE prophylaxis ALL INCLUSIVE VALIDATED RISK ASSESSMENTS:
  - Caprini DVT Risk Assessment
  - Padua Prediction Score
  - International Medical Prevention Registry on Venous Thromboembolism (IMPROVE)

http://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures.aspx

Table 2 Review of available external validation studies for risk assessment models

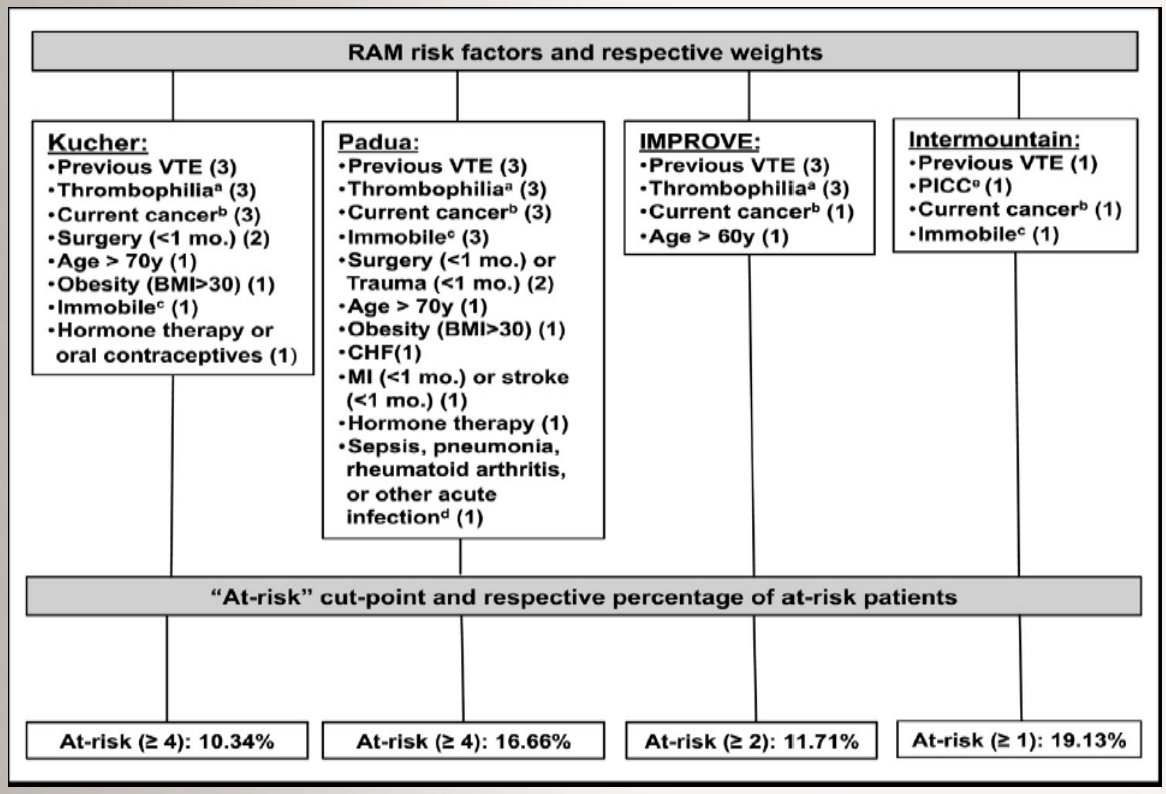
	Model name	Validation studies	Definition of immobility or mobility in the Model	Study type	Setting
1	Padua prediction score [4]	Liu [33]	Reduced mobility + 3	Retrospective	Single site, China
		Greene [25]	Immobile + 1 (defined as having at least one of the following: immobilizing plaster cast, paralysis, or bed rest for ≥72 h prior to hospitalization)	Retrospective	Single site, US
		Zwicker [29]	Reduced mobility	Prospective	Multicenter (5 centers), US
2	Kucher [19]	Greene [25]	Immobile + 1 (defined as having at least one of the following: immobilizing plaster cast, paralysis, or bed rest for ≥72 h prior to hospitalization)	Retrospective	Single site, US
3	IMPROVE [13]	Mahan [30]	Immobilized ≥7days	Retrospective	Multicenter (3 hospitals), US
		Rosenberg [31]	Immobilized ≥ 7days +1	Retrospective	Multicenter, US
		Greene [25]	Immobile + 1 (defined as having at least one of the following: immobilizing plaster cast, paralysis, or bed rest for ≥72 h prior to hospitalization)	Retrospective	Single site, US
4	Geneva risk score [14]	Nendaz [28]	Immobilization 1+ (defined as complete bed rest or inability to walk for >30 min per day for >3 days)	Prospective	Multicenter (3 academic and 5 nonacademic acute care hospitals), Switzerland
5	Wells [6]	Wolf [27]	Immobilization (≥3d) + 1.5	Prospective	Single site, US
		Douma [26]	Recent surgery or immobilization	Prospective	Multicenter (3 teaching hospitals), Switzerland and France
6	Four-element RAM [16]	Greene [25]	Immobile + 1 (defined as having at least one of the following: immobilizing plaster cast, paralysis, or bed rest for ≥72 h prior to hospitalization)	Retrospective	Single site, US

Risk Assessment Models Using Mobility Criteria

- No consistent criteria for mobility
- No accepted mobility standard

Ye F. J Thromb Thrombolysis. 2017 Jul;44(1):94-103. PMID: 28484939.

Frequently Cited Risk Assessment Models



- 90 day post admission VTE rates
  - < 1% for low risk in all models
  - ~ 2.5% for high risk in all models

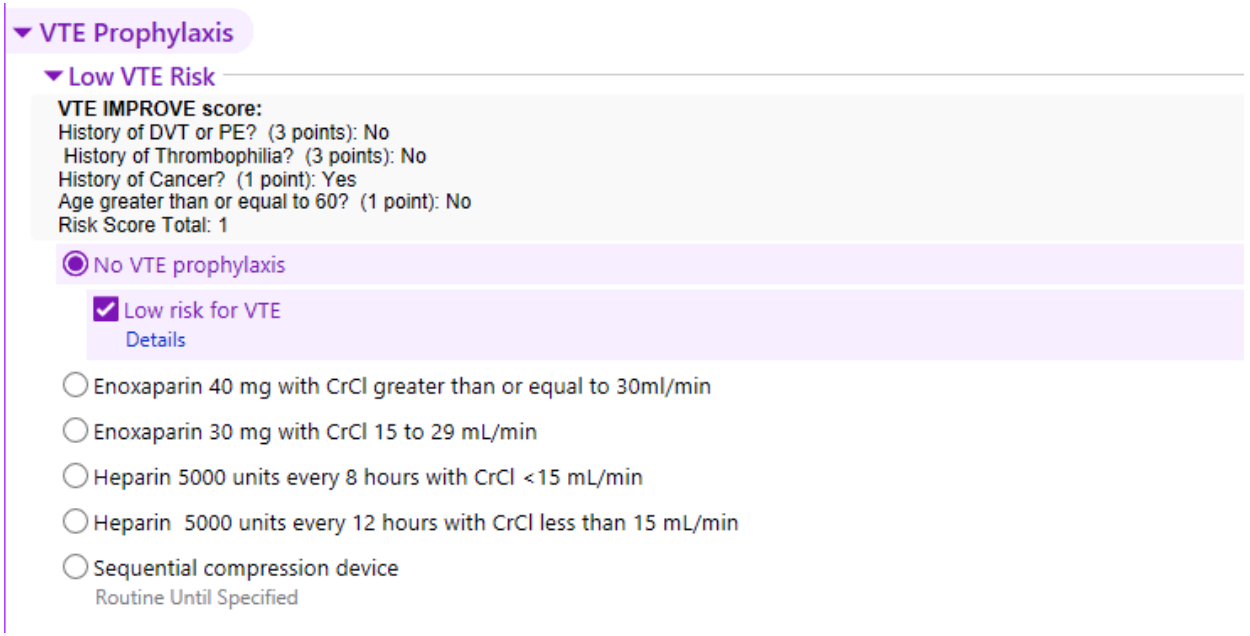
Greene MT. Am J Med. 2016 Sep;129(9):1001.e9-1001.e18. PMID: 27107925

Risk Factor	Score
History of DVT or PE?	Yes = 3 points; No = 0 points
History of thrombophilia?	Yes = 3 points; No = 0 points
Does patient have active cancer?	Yes = 1 point; No = 0 points
Age greater than or equal to 60?	Yes = 1 point; No = 0 points

Score Interpretation

- Low risk - score of 0 - 1 and predicted VTE ≤1.0%
- High score ≥ 2 indicates a considerably greater 3-month VTE risk of ≥ 2%

IMPROVE Risk Assessment Model



LOW VTE RISK orderset

"NO VTE prophylaxis" option is preselected

Discussion

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Questions?