VTE Prophylaxis in Acutely Ill Medical Patients

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Assistant Professor of Medicine

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No Financial Disclosures

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- **Gap:** lack of adherence to latest evidence for VTE prophylaxis in the inpatient setting
- **Need:** lack of education on latest evidence for VTE prophylaxis in the inpatient setting

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Learning Objectives

- Use risk assessment models for VTE prophylaxis
- Use appropriate pharmacologic and mechanical prophylaxes for patients in the hospital
- Identify patients who could benefit from VTE prophylaxis on discharge

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Expected Outcome

- You will be able to use evidence-based techniques for VTE prophylaxis for acute care medicine patients

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History of VTE prophylaxis

1271: Raoul - first likely reported case of DVT

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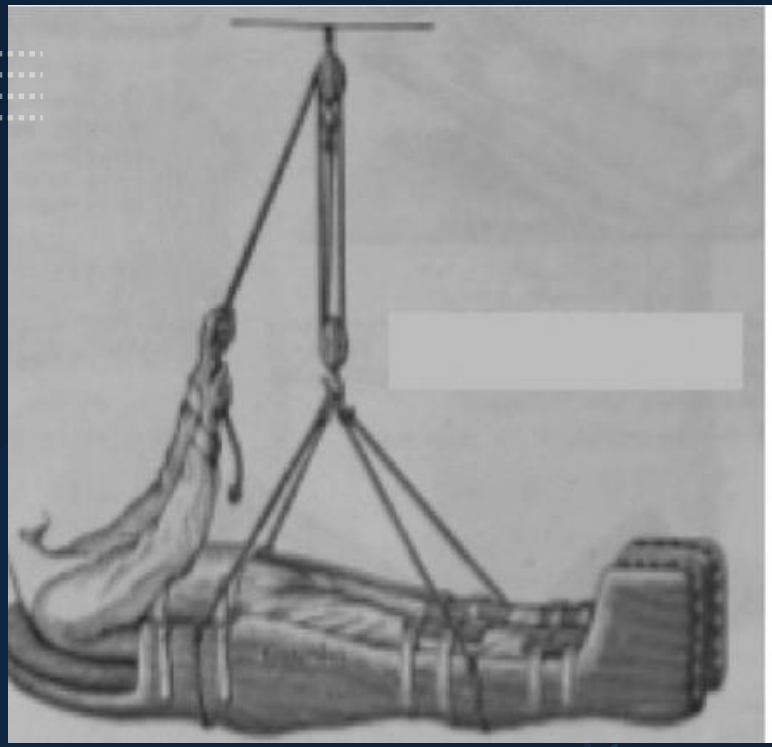
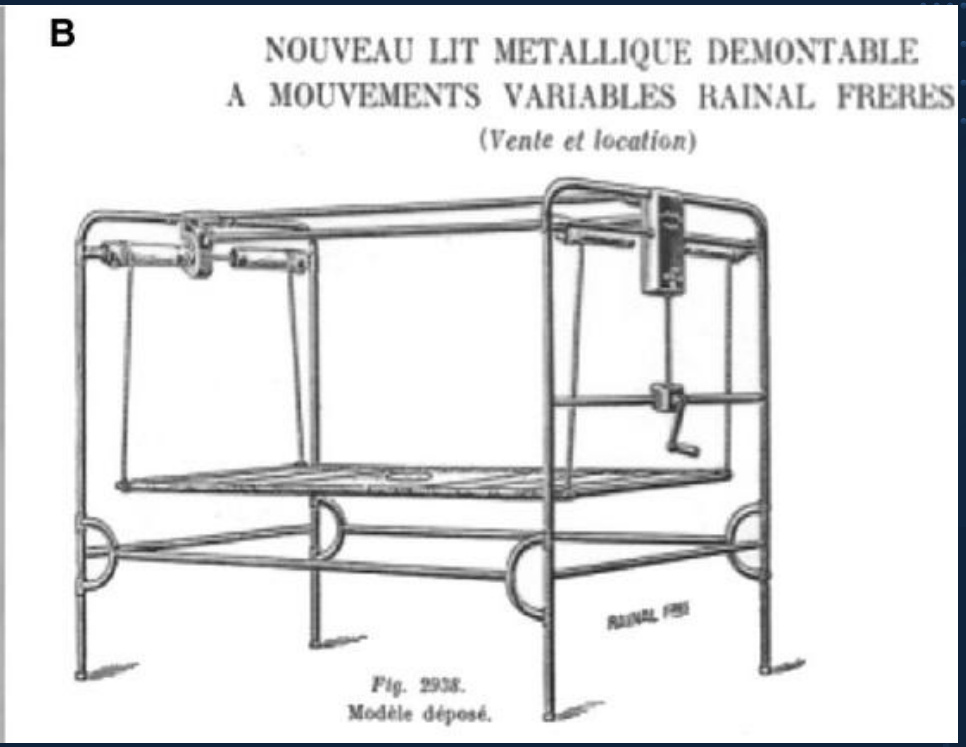
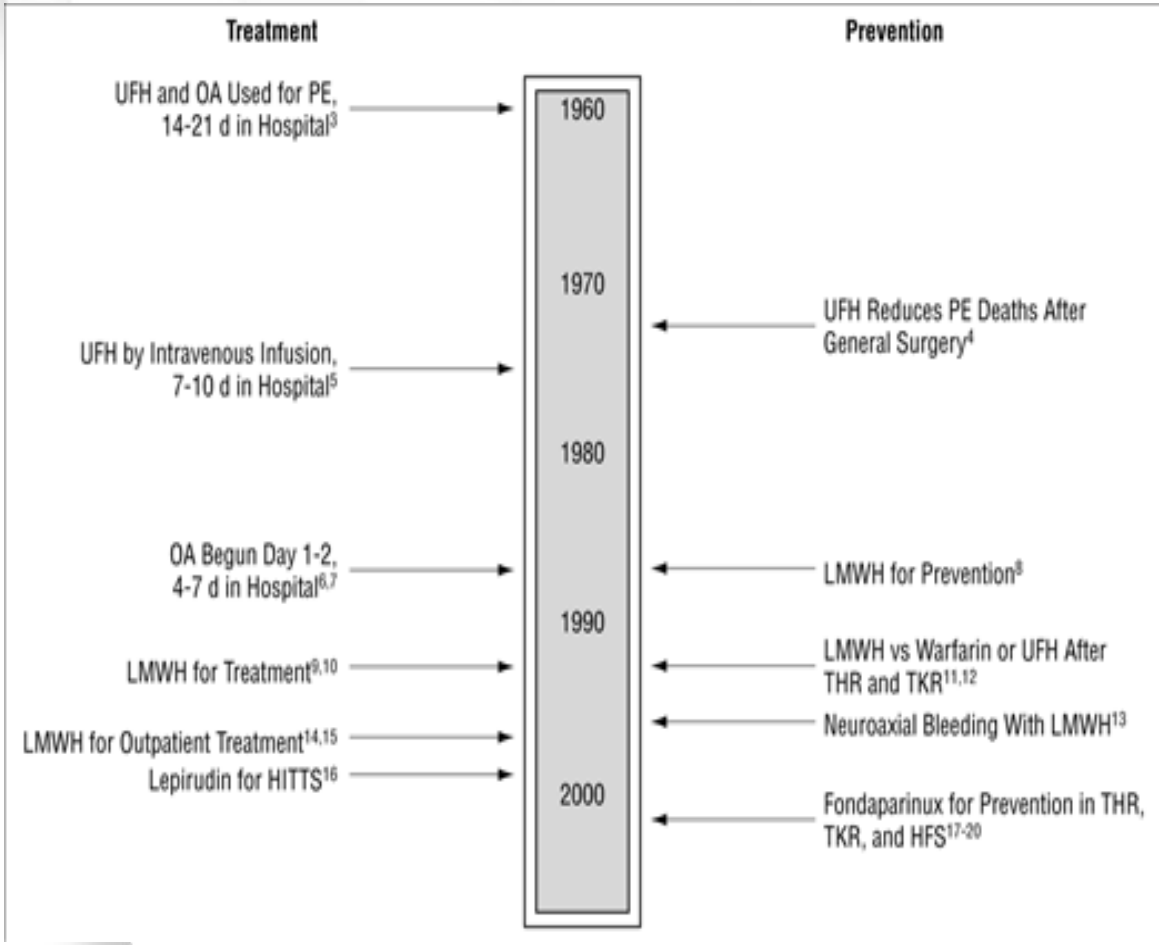




History

- 1793: Hunter hypothesized blood clots cause DVT
- 1856: Virchow finds relationship between DVT and PE
- 1941: Wright proposes DVT ppx in hospitals (early ambulation, avoidance of dehydration, elastic compression)

History



1911: heparin discovered by Doyon/McLean/ Howell
1935: purified, could be used on humans- for post-surgical DVT prophylaxis
1940: Swiss surgeon recommended heparin ppx

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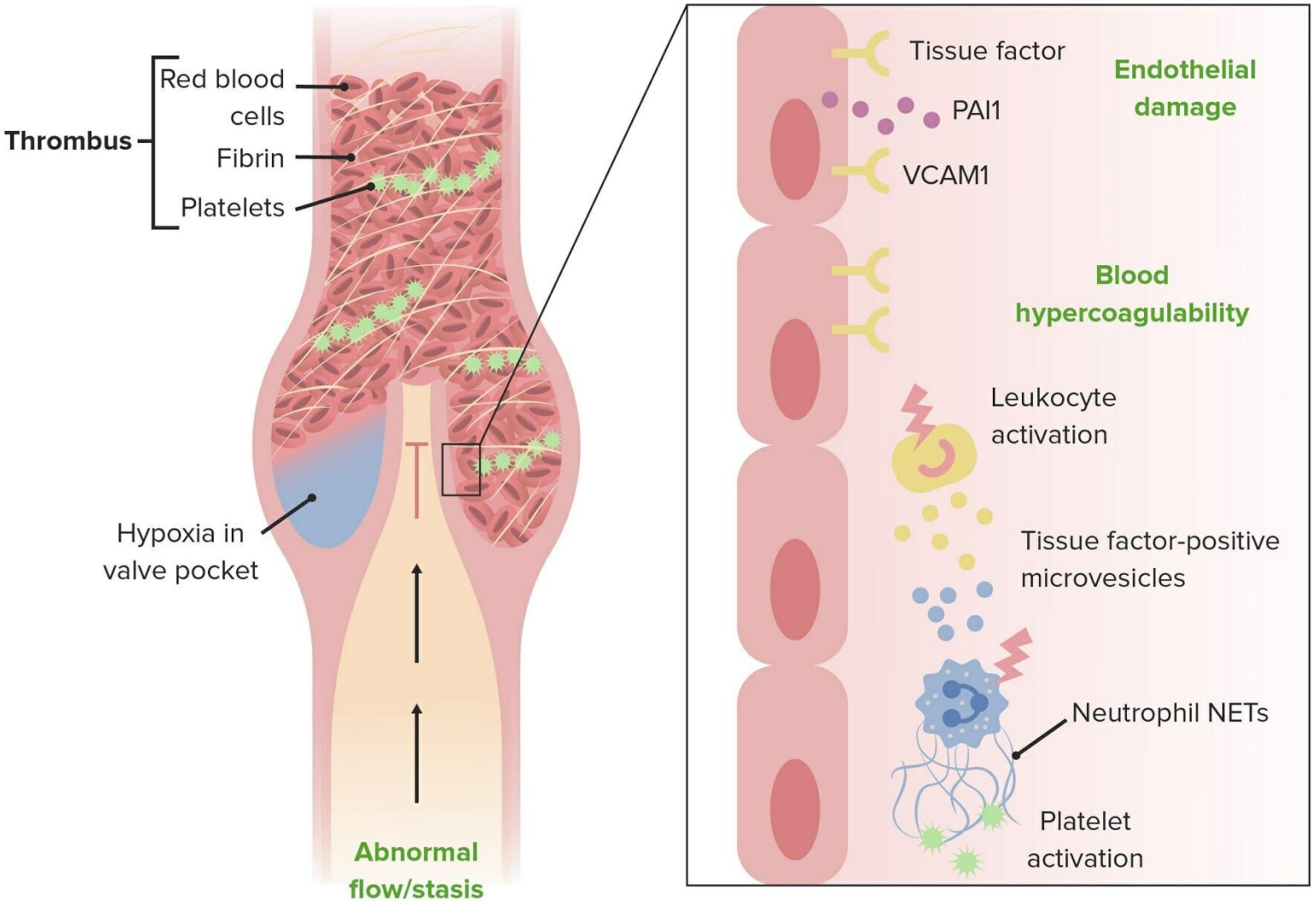

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LMWH in Acutely Ill Medical Patients

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

A Comparison of Enoxaparin with Placebo for the Prevention of Venous Thromboembolism in Acutely Ill Medical Patients

Authors: Meyer Michel Samama, M.D., Alexander Thomas Cohen, M.D., Jean-Yves Darmon, M.D., Louis Desjardins, M.D., Amiram Eldor, M.D., Charles Janbon, M.D., Alain Leizorovicz, M.D., Hélène Nguyen, Pharm.D., Carl-Gustav Olsson, M.D., Ph.D., Alexander Graham Turpie, M.D., and Nadine Weisslinger, M.D., for the Prophylaxis in Medical Patients with Enoxaparin Study Group* Author Info & Affiliations

Published September 9, 1999 | N Engl J Med 1999;341:793-800 | DOI: 10.1056/NEJM199909093411103
VOL. 341 NO. 11

Abstract

BACKGROUND

The efficacy and safety of thromboprophylaxis in pati
may be at risk for venous thromboembolism have not

RESEARCH ARTICLE | Originally Published 2 August 2004 | Check for updates

Randomized, Placebo-Controlled Trial of Dalteparin for the Prevention of Venous Thromboembolism in Acutely Ill Medical Patients

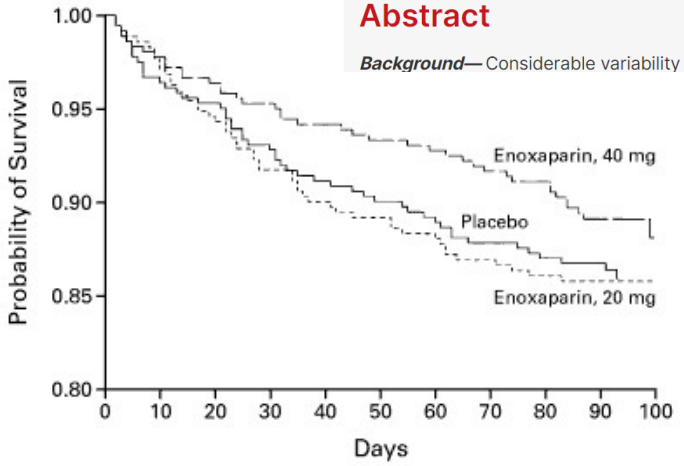
Alain Leizorovicz, MD, Alexander T. Cohen, MD, Alexander G.G. Turpie, MD, Carl-Gustav Olsson, MD, Paul T. Vaitkus, MD, MBA, Samuel Z. Goldhaber, MD, and for the PREVENT Medical Thromboprophylaxis Study Group | AUTHOR INFO & AFFILIATIONS

Circulation • Volume 110, Number 7 • https://doi.org/10.1161/01.CIR.0000138928.83266.24

34,431 / 707 PDF/EPUB

Abstract

Background— Considerable variability exists in the use of pharmacological



No. at Risk

Total	1073	1022	983	965	943	231
Placebo	362	344	329	322	314	77
Enoxaparin, 20 mg	351	332	316	310	302	81
Enoxaparin, 40 mg	360	346	338	333	327	73

MEDENOX 1999
ARTEMIS 2005
PREVENT 2004

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2005: Joint Commission & National Quality Forum

'National Consensus Standards for the Prevention and Care of Deep Vein Thrombosis (DVT)' project

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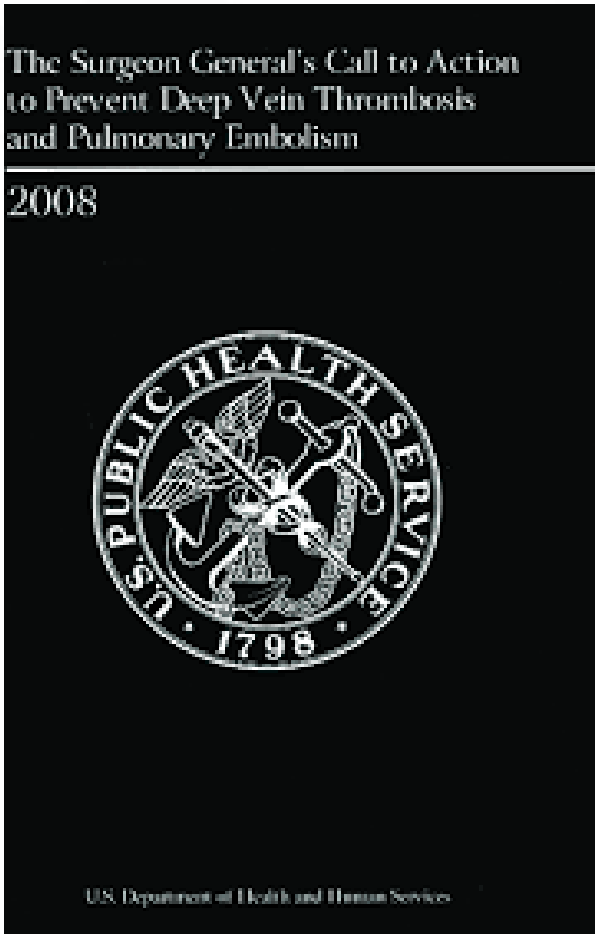
2008- Surgeon General Call to Prevent DVT/PE



- VTE-1
- VTE-2
- VTE-6
- CMS does not pay for HA-VTE since 2008

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Questions for thought

- Does every admitted patient need heparin ppx?
- Is heparin better than LMWH?
- What about DOACs?
- What about my high bleeding risk patients?
- What about mechanical ppx?
- After discharge VTE ppx?

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Case: Medical Inpatient Admission

72-year-old male

Past Medical History: COPD, type 2 diabetes, obesity (body mass index [BMI] of 42 kg/m^2), provoked DVT 20 years ago (after cholecystectomy)

Medications: Tiotropium, metformin, amlodipine, lisinopril

Admitted to: Internal Medicine Ward with cellulitis

Treated with: antibiotics

He is not ambulating on the ward due to generalized weakness.

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Which ONE of the following options would you suggest for thromboprophylaxis during this medical inpatient's hospital admission?

A. Subcutaneous low molecular weight heparin (LMWH)
B. Direct oral anticoagulant (Betrixaban, Rivaroxaban, or Apixaban)
C. Graduated compression stockings
D. No prophylaxis because patient is low thrombosis risk

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Which ONE of the following options would you suggest for thromboprophylaxis during this medical inpatient's hospital admission?

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D. No prophylaxis because patient is low thrombosis risk

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Does everyone hospitalized need pharmacologic prophylaxis?

Home › Journal of Thrombosis and Thrombolysis › Article

Benefits versus risks of pharmacological prophylaxis to prevent symptomatic venous thromboembolism in unselected medical patients revisited. Meta-analysis of the medical literature

Published: 20 April 2012

Volume 34, pages 11–19, (2012) Cite this article

No benefit in unselected patient population
(odds ratio [OR], 0.59; 95% CI, 0.29-1.23)

Small benefit in higher risk patient population NNT: 345 to prevent PE

Original Investigation

FREE

July 23, 2007

Pharmacological Venous Thromboembolism Prophylaxis in Hospitalized Medical Patients

A Meta-analysis of Randomized Controlled Trials

Lironne Wein; Sara Wein; Steven Joseph Haas, BPharm, BPharmSci(Hons), MSHPA; et al

» Author Affiliations | Article Information

Arch Intern Med. 2007;167(14):1476-1486. doi:10.1001/archinte.167.14.1476

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Cochrane Database of Systematic Reviews | Review - Intervention

Heparin for the prevention of venous thromboembolism in acutely ill medical patients (excluding stroke and myocardial infarction)

Raza Alikhan, Rachel Forster, Alexander T Cohen Authors' declarations of interest

Version published: 07 May 2014 Version history
https://doi.org/10.1002/14651858.CD003747.pub4

Increase in major hemorrhage in VTE ppx patients (OR, 1.81; 95% CI, 1.10-2.98; P = .02) NNH= 336

ORIGINAL ARTICLE | VOLUME 22, ISSUE 3, P765-774, MARCH 2024 Download Full Issue

Association of pharmacologic thromboprophylaxis with clinically relevant bleeding and hospital-acquired anemia in medical inpatients: the risk stratification for hospital-acquired venous thromboembolism in medical patients study

Damien Choffat • Jean-Benoît Rossel • Drahomir Aujesky • Peter Vollenweider • Christine Baumgartner • Marie Méan

Published: December 08, 2023 • DOI: https://doi.org/10.1016/j.jtha.2023.11.021

Abstract

Background

Pharmacologic thromboprophylaxis (pTPX) might exacerbate the risk of clinically relevant bleeding (CRB) and acquired anemia (HAA) in older multimorbid inpatients.

Prospective Cohort Study in 3 Swiss Hospitals

Primary Outcome: **HAA** rates

1305 patients (90% low bleeding risk)→ 809 (62%) received pTPX

Results:

- CRB rates (2.2% vs 2.2%)
- HAA rates (**23.2%** vs **15.3%**) (OR 1.4; CI 1.0-2.1)
- Median drop in Hgb (0.7 vs 0.2 g/dl)

⬆ Hospital acquired Anemia

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Journal of Hospital Medicine

shm Society of Hospital Medicine

Choosing Wisely®: Things we do for no Reason™ | Full Access

Things We Do for No Reason™: Universal Venous Thromboembolism Chemoprophylaxis in Low-Risk Hospitalized Medical Patients

Brooke Barlow PharmD, Ashley Barlow PharmD, Anthony C Breu MD

First published: 01 May 2021 | https://doi.org/10.12788/jhm.3502

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Who will most benefit from VTE prophylaxis?

High Risk VTE risk?

Low Bleeding Risk?

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Who is at risk of developing VTE?

- Risk Assessment Models (RAMs) will help risk stratify medically ill patients.
- Examples: **Padua score, Improve score**

Padua and IMPROVE VTE RAMs

Padua prediction score

Items	Score
Active cancer (metastases and/or chemoradiotherapy in the previous 6 months)	3
Previous VTE (with the exclusion of superficial vein thrombosis)	3
Bedrest for ≥3 days	3
Thrombophilia	3
Recent (≤1 month) trauma and/or surgery	2
Elderly age (≥70 years)	1
Heart and/or respiratory failure	1
Acute myocardial infarction or ischemic stroke	1
Acute infection and/or rheumatologic disorder	1
Obesity (BMI ≥30 kg/m^2)	1
Ongoing hormonal treatment	1

High risk of VTE: ≥4 points. VTE: Venous thromboembolism; BMI: Body mass index.

IMPROVE VTE RAM: Score ≥2 Indicates Increased VTE Risk†	
Risk factor(s)	Points
Previous VTE	3
Known thrombophilia	2
Lower limb paralysis[b]	2
Active cancer	2
Immobilization of ≥7 days	1
ICU/CCU stay	1
Age > 60 years	1

Abbreviations: ICU, intensive care unit; CCU, coronary care unit.
a. Congenital or acquired thrombophilic condition (e.g., factor V Leiden, lupus anticoagulant, protein C or protein S deficiency)
b. Leg falls to bed by 5 seconds but has some effort against gravity utilizing NIH stroke scale
†Risk level:
Score of 0 -1 low risk
Score of 2 – 3 moderate risk
Score of ≥ 4 high risk

1. Barbar, S., Noventa, F., Rossetto, V., Ferrari, A., Brandolin, B., Perlati, M., ... & Prandoni, P. (2010). A risk assessment model for the identification of hospitalized medical patients at risk for venous thromboembolism: the Padua Prediction Score. *Journal of Thrombosis and Haemostasis*, *8*(11), 2450-2457.
2. Spyropoulos, A. C., Anderson Jr, F. A., FitzGerald, G., Decousus, H., Pini, M., Chong, B. H., ... & Monreal, M. (2011). Predictive and associative models to identify hospitalized medical patients at risk for VTE. *Chest*, *140*(3), 706-714.

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Many other risk assessment models

Development and validation of a risk model for hospital-acquired venous thrombosis: the Medical Inpatients Thrombosis and Hemostasis study

Neil A. Zakai • Katherine Wilkinson • Andrew D. Sparks • ... Craig Hooper • Nicholas L. Smith •

Venous thrombosis risk assessment in medical inpatients: the medical inpatients and thrombosis (MITH) study

N.A. Zakai • P.W. Callas • A.B. Repp • M. Cushman

Rogers[53]	Intermountain[55]	IMPROVE[56]	Premier[58]
142	22	52	374
U.S.	U.S.	12 countries	U.S.
Prospective	Retrospective	Prospective	Retrospective
Surgical	Medical	Medical	Medical

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Guidelines from Societies favor RAM

AHRQ Agency for Healthcare Research and Quality

AMERICAN SOCIETY OF HEMATOLOGY

CHEST

Volume 141, Issue 2, Supplement, February 2012, Pages e419S-e496S

Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physician Evidence-Based Clinical Practice Guidelines Online Only Articles

Antithrombotic Therapy for VTE Disease: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines

ASH Clinical Practice Guidelines on Venous Thromboembolism

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Circulation

CURRENT IS

REVIEW ARTICLE | Originally Published 7 May 2020 |

Check for updates

Call to Action to Prevent Venous Thromboembolism in Hospitalized Patients: A Policy Statement From the American Heart Association

*"The AHA recommends a central steward for data tracking VTE risk assessment, application of VTE prophylaxis, and VTE rates for all hospitals such as the **Core Quality Measures** Collaborative."*

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Implementation of Risk Assessment

>400 pts: prospective and retrospective cohort study over 1 year

No change in VTE and bleeding rates

Decreased VTE ppx rates (saved €1.67 / pt (27.2% decrease))

Clinical impact of application of risk assessment models (Padua Prediction Score and Improve Bleeding Score) on venous thromboembolism, major hemorrhage and health expenditure associated with pharmacologic VTE prophylaxis: a "real life" prospective and retrospective observational study on patients hospitalized in a Single Internal Medicine Unit (the STIME study)

IM – ORIGINAL | Published: 03 March 2018

RESEARCH ARTICLE | Originally Published 6 February 2024

Check for updates

Impact of Embedding a Venous Thromboembolism Risk Assessment Model in the Electronic Health Record Versus Usual Care: A Cluster-Randomized Trial

Michael B. Rothberg, MD, MPH, Aaron C. Hamilton, MD, MBA, Bo Hu, PhD, Megan Sheehan, MD, Jacqueline Fox, RN, Alex Milinovich, BS, Oleg Lisheba, MS, Toyomi Goto, MA, Sidra L. Speaker, MD, and Matthew A. Pappas, MD, MPH | AUTHOR INFO &

Adding VTE risk calculator (Padua) did **not** change **VTE** and **bleeding rates** (reduced VTE ppx from **73→ 65**%)

Limitation: use 24%

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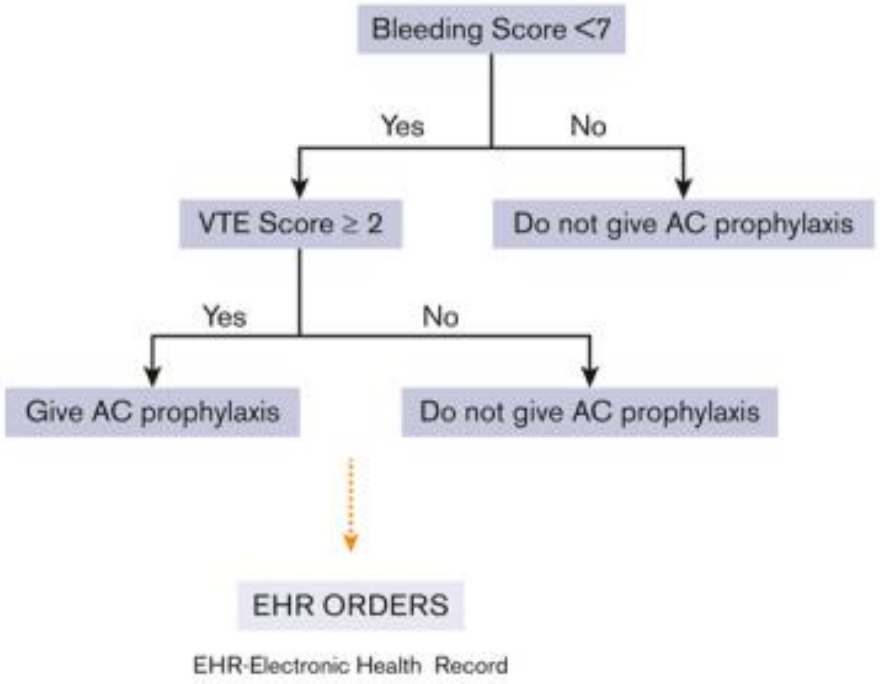
Converting IMPROVE bleeding and VTE predictive models into FFT (T) for implementing most optimal hospital VTE prophylaxis at the point of care



Proposed decision tree: Djulbegovic B et al. Converting IMPROVE bleeding and VTE risk assessment models into a fast-and-frugal decision tree for optimal hospital VTE prophylaxis. Blood Adv. 2024 Jun 25;8(12)

blood advances Visual Abstract

KEY DRIVER DIAGRAM

Project Name: VTE prophylaxis project
Project Leader: Arunab Mehta, MD
Revision Date: 03/15/2024

GLOBAL AIM

Increase appropriate VTE prophylaxis for medical admitted patients

SMART AIM

Increase the appropriate VTE prophylaxis rates in medical admitted patient from 50 to 75% to help align this practice with guideline and joint commission standards by November 30, 2023.

POPULATION

Medical, non-surgical, non-ICU patients on general medicine services.

KEY DRIVERS (What)

- Inclusion of standard risk assessment method available for providers to use
- Inclusion of standardized option to help provider order appropriate ppx in orderset
- Awareness of providers to risk stratify patients for VTE on admission
- Nursing awareness for patient ambulation and documentation
- System to re-address change in VTE risk throughout hospitalization
- Improve patient awareness on importance of VTE ppx (refusals)

INTERVENTIONS (How)(Active, Completed, Future)

- Add Risk Assessment calculator to admission order set
- Make standardized orderset organizing preferred VTE ppx by renal function/weight
- Educating providers about importance of VTE risk stratification – email vs annual training module
- Nursing education about ambulation and VTE ppx-email
- Nursing education module on VTE ppx and documentation
- Add VTE risk calculator led reassessment during every transfer
- BPA alert frequently or change in Storyboard
- Add patient education on admission (in room) on importance of VTE ppx

VTE Prophylaxis Project

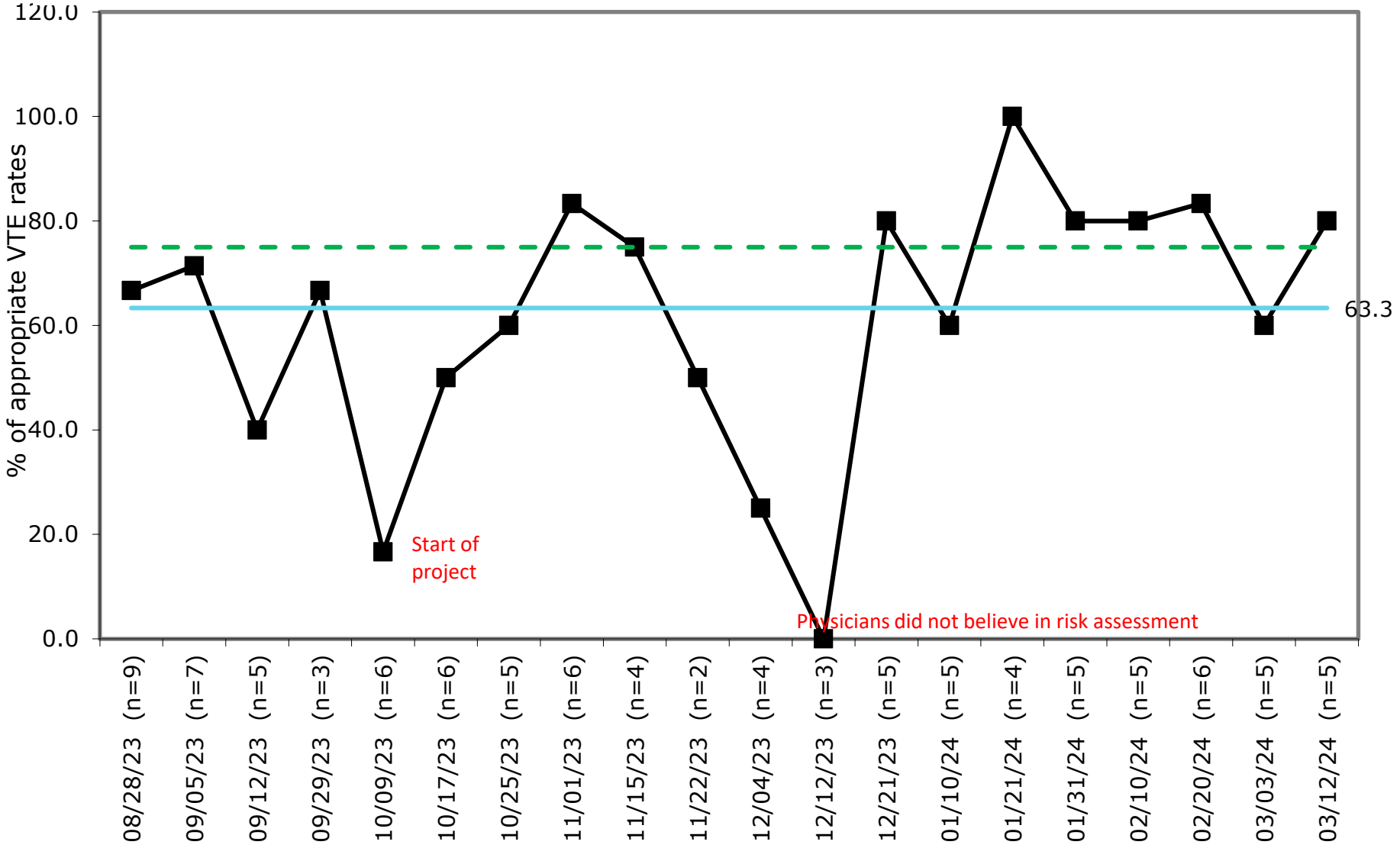


Chart prepared by: Arunab Mehta

Data source: Collected data

What is the best pharmacologic ppx?

August 9, 2022

Low-Molecular-Weight Heparin Outperforms Other Options for Inpatient VTE Prophylaxis

Bruce Soloway, MD and Daniel D. Dressler, MD, MSc, MHM, FACP, reviewing Eck RJ et al. BMJ 2022 Jul 4

A meta-analysis supports current guidelines and demonstrates that LMWH balances benefits and risks better than unfractionated heparin or direct-acting oral anticoagulants.

- LMWH (40 mg daily) (>20,000 pts in 20 studies) & fondaparinux (850 pts in 1 study**)** **reduced symptomatic VTE rates** compared to placebo.
- UFH (3x daily) and DOACs **increased bleeding** rates (ORs 2.63 and 2.31 respectively)
- LMWH is once daily
- LMWH has lower rates of HIT

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LMWH outweighs heparin in critically ill patients

Outcomes	Relative effect: RR (95% CI)	Anticipated absolute effects (95% CI)	
		Risk with UFH	*Risk difference with LMWH*
Mortality	**0.90** (0.75 to 1.08)	243 per 1,000	**24 fewer deaths per 1,000** (61 fewer to 19 more)
PE	**0.80** (0.44 to 1.46)	11 per 1,000	**2 fewer PE per 1,000** (6 fewer to 5 more)
Symptomatic proximal DVT	**0.87** (0.60 to 1.25)	25 per 1,000	**3 fewer DVT per 1,000** (10 fewer to 6 more)
Major bleeding	**0.98** (0.76 to 1.27)	53 per 1,000	**1 fewer bleeds per 1,000** (13 fewer to 14 more)
Heparin-induced thrombocytopenia	**0.42** (0.15 to 1.18)	6 per 1,000	**4 fewer episodes per 1,000** (5 fewer to 1 more)

Quality of Evidence (GRADE): Low Moderate Strong

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Which ONE of the following options would you suggest for thromboprophylaxis during this medical inpatient's hospital admission?

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B. Direct oral anticoagulant (Betrixaban, Rivaroxaban, or Apixaban)
C. Graduated compression stockings
D. No prophylaxis because patient is low thrombosis risk

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Our Patient's Risk factors for VTE

Padua RAM: Factors
Previous VTE
Thrombophilia
Active cancer
Age > 70 years
Reduced mobility
Recent trauma/surgery
Heart or respiratory failure
Acute MI or stroke
Hormonal treatment
Obesity (BMI > 30)
Infection/rheumatologic

IMPROVE-VTE RAM: Factors
Previous VTE
Thrombophilia
Active cancer
Age > 60 years
Immobilization of ≥ 7 days
Lower limb paralysis
ICU/CCU stay

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Could you use DOACs for VTE ppx?

- ↑ bleeding rate
- ↑ expense

Clearance issues with renal impairment

August 9, 2022

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LMWH > DOACs

Outcomes	Relative effect: RR (95% CI)	Anticipated absolute effects (95% CI)	
		Risk with prophylactic LMWH	*Risk difference with any DOAC*
Mortality	**0.64** (0.21 to 1.98)	1 per 1,000	**0 fewer deaths per 1,000** (1 fewer to 1 more)
PE	**1.01** (0.29 to 3.53)	1 per 1,000	**0 fewer PE per 1,000** (1 fewer to 3 more)
Symptomatic proximal DVT	**1.03** (0.34 to 3.08)	2 per 1,000	**0 fewer DVT per 1,000** (1 fewer to 4 more)
Major bleeding	**1.70** (1.02 to 2.82)	2 per 1,000	**2 more bleeds per 1,000** (0 fewer to 4 more)*

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High bleeding risk but high VTE risk?

Could you use heparin 5000 units BID instead of TID?

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Unfractionated Heparin BID vs TID

- VTE rate (BID, 5.4; vs TID, 3.5; p = 0.87)
- PE rate [BID, 1.5; vs TID, 0.5; p = 0.09]
- Proximal DVT and PE rate (BID, 2.3; vs TID, 0.9; p = 0.05)
- Bleeding rate (BID, 0.35; vs TID, 0.96; p < 0.001)

Assess bleeding risk in your patient!

Back to our patient:

Your patient developed some redness in his stools. You suspect GI bleeding. You decide to withhold pharmacologic prophylaxis to ensure hemostasis.

Which of the following options for thromboprophylaxis would you suggest at this time?

A. Graduated compression stockings
B. Pneumatic compression devices
C. Calf exercises
D. No mechanical prophylaxis is needed

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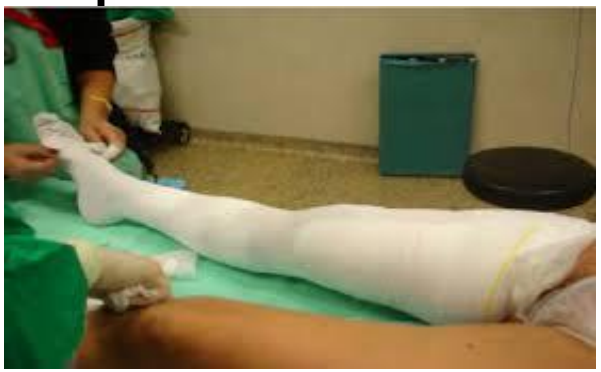
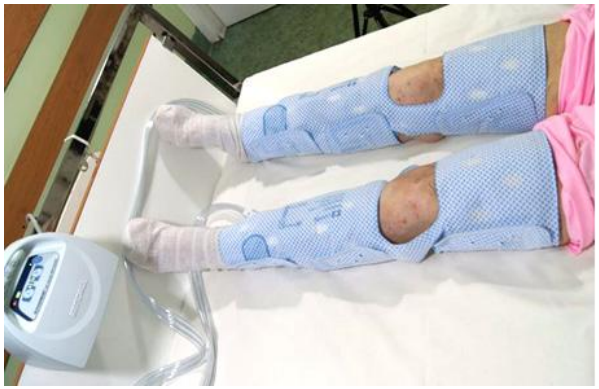
Can’t use pharmacologic agents? What about mechanical thromboprophylaxis?

Types of mechanical thromboprophylaxis

- Graduated Compression Stockings (GCS)



- Intermittent Pneumatic Compression Devices (IPC)



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Mechanical prophylaxis

Pneumatic Compression devices compared to graduated compression stockings (10 RCTs)

Outcome	Relative effect	Risk difference
Mortality	3.43	0 fewer per 1,000
PE	0.38	27 fewer per 1,000
Symptomatic proximal DVT	0.16	110 fewer per 1,000

ASH recommends using either methods

AAFP recommends using PCD

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Pharmacologic + mechanical prophylaxis?

The NEW ENGLAND JOURNAL of MEDICINE

SPECIALTIES TOPICS MULTIMEDIA CURRENT ISSUE LEARNING/CME AUTHOR CENTER PUBLICATIONS

ORIGINAL ARTICLE

Adjunctive Intermittent Pneumatic Compression for Venous Thromboprophylaxis

Authors: Yaseen M. Arabi, M.D., Fahad Al-Hameed, M.D., Karen E.A. Burns, M.D., Sangeeta Mehta, M.D., Sami J. Alsolamy, M.D., M.P.H., Mohammed S. Alshahrani, M.D., Yasser Mandourah, M.D., +16, for the Saudi Critical Care Trials

No increase in incidental proximal DVT!!

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You are discharging your patient after an acute medical illness. He has received prophylaxis with LMWH in hospital for 9 days. He is ambulatory and back on his usual medications.

What would you recommend on discharge for VTE prophylaxis?

A. Stop LMWH on the day of discharge
B. Extend LMWH for 3 weeks post-discharge
C. Switch LMWH on discharge to a DOAC, and continue the DOAC for 3 weeks post-discharge
D. Graduated compression stockings for 3 weeks post-discharge

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D. Graduated compression stockings for 3 weeks post-discharge

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Extended VTE Prophylaxis

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Trials for extended prophylaxis

Study	Extended Prophylaxis
EXCLAIM[9]	Enoxaparin 40 mg/d 28 d after initial open-label enoxaparin 10 ± 4 days
ADOPT[10]	Apixaban 2.5 mg twice/d 30 days
MAGELLAN[11]	Rivaroxaban 10 mg/d 35 ± 4 days
APEX[12]	Betrixaban 80 mg/d 35-42 days
MARINER[13]	Rivaroxaban 10 mg/d 45 days after in-hospital LMWH or unfractionated heparin

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Summary of trials

PE	0.67 (0.41 to 1.09)	4 per 1,000	**1 fewer PE per 1,000** (2 fewer to 0 fewer)
Symptomatic proximal DVT	0.62 (0.36 to 1.05)	6 per 1,000	**2 fewer DVT per 1,000** (4 fewer to 0 fewer)
Major bleeding	1.99 (1.08 to 3.65)	4 per 1,000	**4 more bleeds per 1,000** (0 more to 10 more)

American Society of Hematology: In acutely ill hospitalized medical patients, the panel recommends **inpatient VTE prophylaxis with LMWH only**, rather than inpatient and extended duration outpatient VTE prophylaxis with DOACs *(strong recommendation, moderate certainty)*

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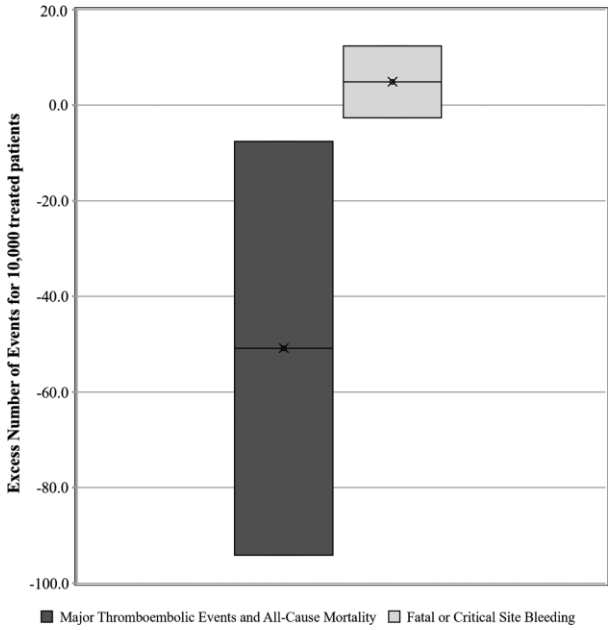
Pooled cohort analysis of Magellan/Mariner trials

NNT: 197
NNH: 2045

(FDA Approval for Rivaroxaban= 31-39 days post-hospitalization; exceptions for recent bleeding, active duodenal ulcer bleeding, cancer, pulmonary cavitation.)



NATF recommends extended VTE prophylaxis with DOAC for high-risk patients

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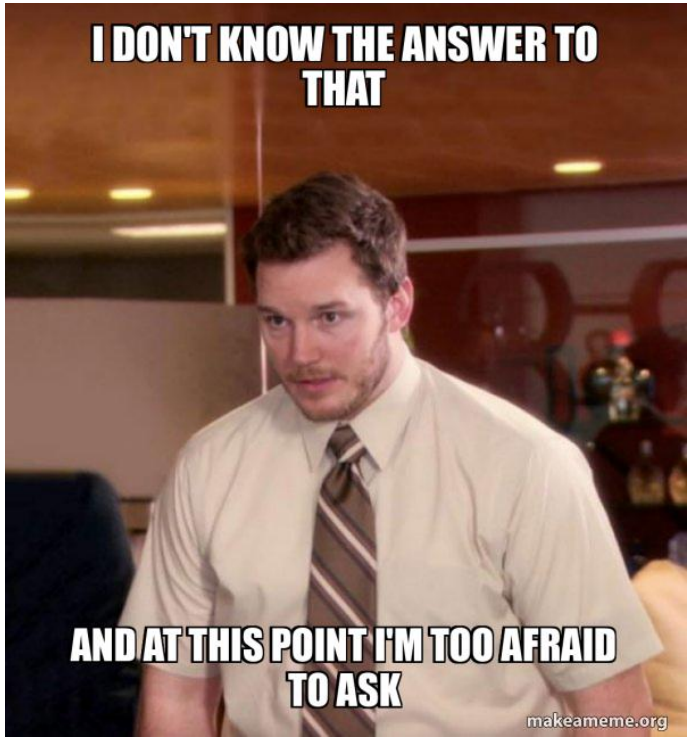
Final Answer?



- **Risk assess your patient!!**

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IMPROVEDD risk score calculator

Please check the boxes that apply to you to get your individualized IMPROVEDD Risk score for VTE at 42 days after hospitalization:

Prior episode of VTE	☑
Thrombophilia	☑
Paralysis of the lower extremity during the hospitalization	☐
Current malignancy	☐
D-dimer ≥ 2x Upper Limit of Normal (ULN)	☑
Immobilization for at least 7 days	☐
ICU or CCU admission	☑
Age more than 60 years	☐

Score: 8

Predicted VTE risk through 3 months is 2.2%

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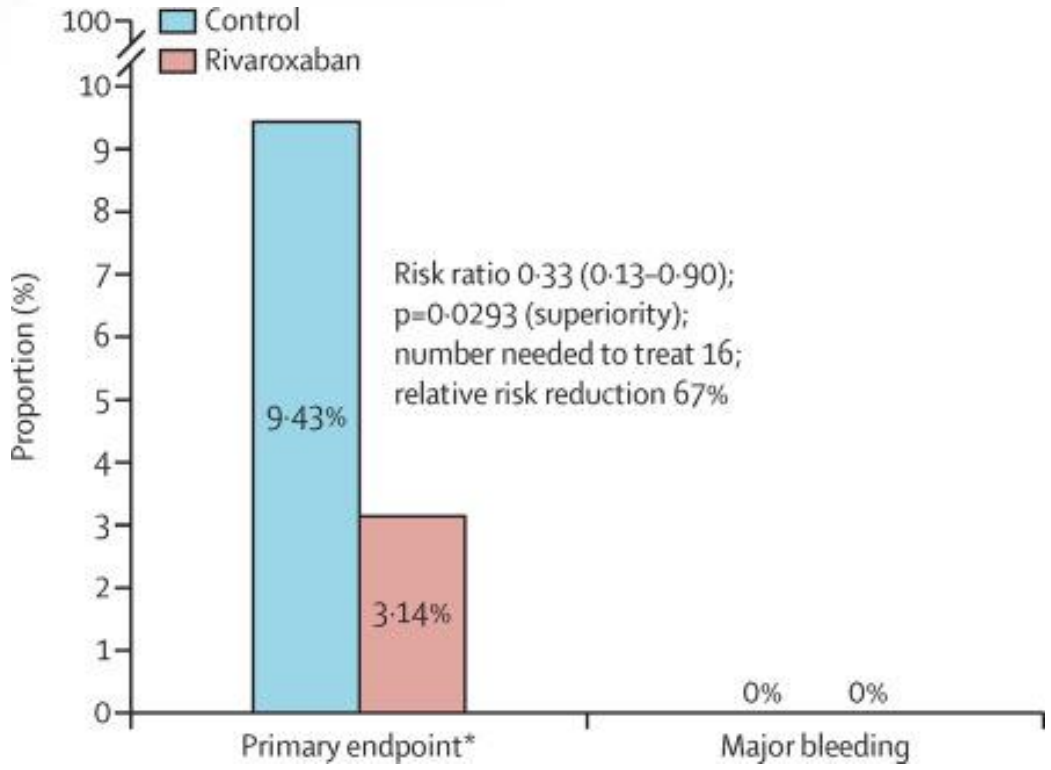
MICHELLE trial (2022): Extended VTE ppx in COVID-19 patients (high risk!)



Primary Outcome= composite of symptomatic or fatal venous thromboembolism, asymptomatic venous thromboembolism on bilateral lower-limb venous ultrasound and CT pulmonary angiogram, symptomatic arterial thromboembolism, and cardiovascular death at day 35

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Universal clinical decision support tool for thromboprophylaxis in hospitalized COVID-19 patients: post hoc analysis of the IMPROVE-DD cluster randomized trial

Mark Goldin [1,2,3] · Nikolaos Tsaftaridis [1,2] · Ioannis Koulas [1,2,4] · ... · Kanta Ochani [1,2] · Thomas McGinn [7,8] · Alex C. Spyropoulos [1,2,3] ... Show more

CDS vs no CDS

Primary outcome: rates of appropriate VTE ppx

Secondary outcomes: rates of **major thromboembolism**, **all-cause and VTE-related readmissions and death**, **major bleeding**, and **all-cause mortality** 30 days after discharge

- ⇧ At-discharge VTE ppx: 42.6% vs 28.8%
- ⇩ VTE rates (OR, 0.54; 95% CI, 0.39-0.75; *P* < .001)
- ⇩ Arterial thromboembolism (OR, 0.10; 95% CI, 0.01-0.81; *P* = .01)
- ⇩ Total thromboembolism (OR, 0.50; 95% CI, 0.36-0.69; *P* < .001)
- ⇩ 30-day all-cause readmission/death (OR, 0.78; 95% CI, 0.62-0.99; *P* = .04)
- ⇔ Major Bleeding

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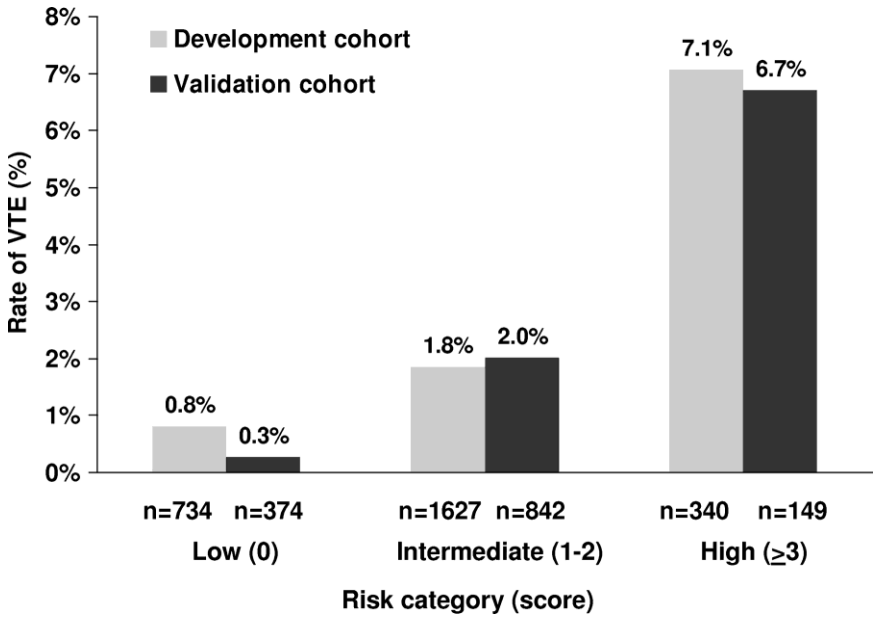
VTE prophylaxis in cancer patients

Khorana Score ≥ 2 = consider VTE ppx in ambulatory settings



For ambulatory patients with cancer at intermediate risk for thrombosis receiving systemic therapy, the ASH guideline panel *suggests* thromboprophylaxis with a DOAC (apixaban or rivaroxaban) or no thromboprophylaxis (conditional recommendation, moderate certainty in the evidence of effects ⊕⊕⊕◯).

For ambulatory patients with cancer at high risk for thrombosis receiving systemic therapy, the ASH guideline panel *suggests* thromboprophylaxis with a DOAC (apixaban or rivaroxaban) over no thromboprophylaxis (conditional recommendation, moderate certainty in the evidence of effects ⊕⊕⊕◯).

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Take home points

- ✓ Use Risk Assessment Models to help identifying who needs pharmacologic VTE prophylaxis in the hospital
- ✓ LMWH works best for most patients as a pharmacologic agent for VTE prophylaxis
- ✓ Most patients do not need VTE prophylaxis on discharge (but a few might!)

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WHEN?
WHO?
WHAT?
WHEN?
ANY
WHERE?
QUESTIONS?
What?
Where?
WHAT?
WHEN?
HOW?
WHAT?
WHERE?
HOW?


Q
&
A
THANK YOU