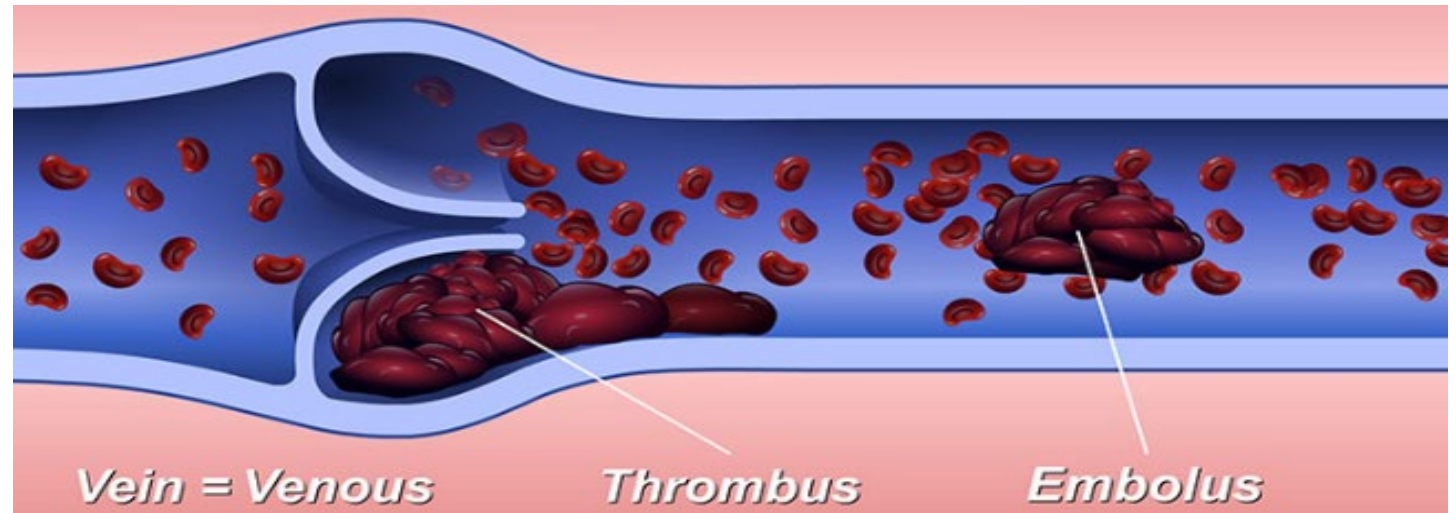


VTE Prevention Among Hospitalized Patients: Current Challenges and Opportunities for Improvement

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March is National DVT Awareness Month

Spread knowledge,
save lives!



NYS PARTNERSHIP FOR PATIENTS
GUIDING PRINCIPLES
FOR REDUCING VENOUS THROMBOEMBOLISM

Healthcare-Associated Blood Clots: Minimize Your Risk

The Problem

Healthcare-associated venous thromboembolism (blood clots) is a significant, deadly, costly, and growing public health problem.

Prevention Can Save Lives

Proven ways to prevent blood clots from occurring during or after a healthcare encounter exist, but not all hospitals and healthcare facilities have put these prevention strategies into practice or use them routinely.



For more information, please visit
<http://www.cdc.gov/ncbddd/dvt/>



Make the Choice to Stop the Clot®

**JOIN OUR GLOBAL MOVEMENT
TO STOP BLOOD CLOTS
& SAVE LIVES**

Join us as a partner, supporter,
community mobilizer! More than
1,500 groups already have. Will you?

WORLDTHROMBOSISDAY.ORG

Disclosures

Allison E. Burnett

- Wolters Kluwer: Up to Date chapter author, peer reviewer, editorial consultant
- Anticoagulation Forum: board of directors
- National Certification Board for Anticoagulation Providers: board of directors

Kurt Mahan

- Consultant/Advisor – Janssen, Portola, American College of Emergency Physicians Expert Panel, PowerPak CE
- Speaker – Janssen, Portola, BMS/Pfizer
- National Quality Forum Cardiovascular Steering Committee – voting member for performance measures 2016 to present
- American Society of Health System Pharmacists - Council on Therapeutics – Recent Chair, Vice-Chair, Member and Honorarium for Speaking at Conference



Learning Objectives

Discuss the epidemiology and impact of hospital-associated VTE

Summarize existing evidence and guideline recommendations pertaining to VTE prevention among hospitalized patients

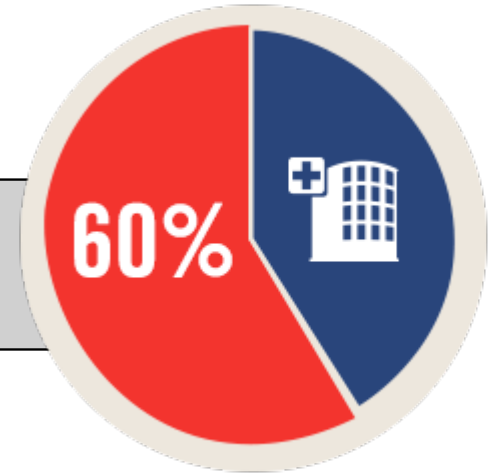
Examine existing regulatory measures for VTE prevention and potential needed changes

Provide a brief overview of the anticoagulation stewardship core elements from the Anticoagulation Forum

Explain how core elements of anticoagulation stewardship may be applied to VTE prevention efforts

Hospital-associated VTE: Key Numbers


Nearly 60% of all VTEs occur during or within 90 days of hospitalization



Incidence is equally distributed between medical and surgical patients

Leading cause of death among hospitalized patients



Most Recent VTE Prevention Guidelines

CLINICAL GUIDELINES 

American Society of Hematology 2018 guidelines for management of venous thromboembolism: prophylaxis for hospitalized and nonhospitalized medical patients

Holger J. Schünemann,^{1,2*} Mary Cushman,^{3,4*} Allison E. Burnett,⁵ Susan R. Kahn,⁶ Jan Beyer-Westendorf,^{7,8} Frederick A. Spencer,¹ Suely M. Rezende,⁹ Neil A. Zakai,^{3,4} Kenneth A. Bauer,¹⁰ Francesco Dentali,¹¹ Jill Lansing,¹² Sara Balduzzi,¹³ Andrea Darzi,² Gian Paolo Morgano,² Ignacio Neumann,^{2,14} Robby Nieuwlaet,² Juan J. Yepes-Nuñez,² Yuan Zhang,² and Wojtek Wiercioch²

¹Department of Medicine and ²Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, ON, Canada; ³Department of Medicine and ⁴Department of Pathology and Laboratory Medicine, University of Vermont Lamer College of Medicine and University of Vermont Medical Center, Burlington, VT; ⁵Inpatient Antithrombosis Service, University of New Mexico Health Sciences Center, Albuquerque, NM; ⁶Department of Medicine, McGill University and Lady Davis Institute, Montreal, QC, Canada; ⁷Thrombosis Research Unit, Division of Hematology, Department of Medicine I, University Hospital "Carl Gustav Carus," Dresden, Germany; ⁸Kings Thrombosis Service, Department of Hematology, Kings College London, United Kingdom; ⁹Department of Internal Medicine, Faculty of Medicine, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil; ¹⁰Department of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA; ¹¹Department of Medicine and Surgery, Insubria University, Varese, Italy; ¹²State University of New York, Albany, NY; ¹³Cochrane Italy, Department of Diagnostic, Clinical and Public Health Medicine, University of Modena and Reggio Emilia, Modena, Italy; and ¹⁴Department of Internal Medicine, School of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile

CLINICAL GUIDELINES  

American Society of Hematology 2019 guidelines for management of venous thromboembolism: prevention of venous thromboembolism in surgical hospitalized patients

David R. Anderson,¹ Gian Paolo Morgano,² Carole Bennett,³ Francesco Dentali,⁴ Charles W. Francis,⁵ David A. Garcia,⁶ Susan R. Kahn,⁷ Maryam Rahman,⁸ Anita Rajasekhar,⁹ Frederick B. Rogers,¹⁰ Maureen A. Smythe,^{11,12} Kari A. O. Tikkinen,^{13,14} Adolph J. Yates,¹⁵ Tejan Baldeh,² Sara Balduzzi,¹⁶ Jan L. Brožek,^{2,17} Itziar Etxeandia-Ikobaltzeta,² Herman Johal,¹⁸ Ignacio Neumann,¹⁹ Wojtek Wiercioch,² Juan José Yepes-Nuñez,²⁰ Holger J. Schünemann,^{2,17} and Philipp Dahm^{21,22}

¹Department of Medicine, Dalhousie University, Halifax, NS, Canada; ²Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, ON, Canada; ³Shreveport, LA; ⁴Department of Medicine and Surgery, Insubria University, Varese, Italy; ⁵Wilmot Cancer Center, University of Rochester Medical Center, Rochester, NY; ⁶Division of Hematology, Department of Medicine, University of Washington Medical Center, University of Washington School of Medicine, Seattle, WA; ⁷Department of Medicine, McGill University and Lady Davis Institute, Montreal, QC, Canada; ⁸Lillian S. Wells Department of Neurosurgery and ⁹Division of Hematology and Oncology, Department of Medicine, University of Florida, Gainesville, FL; ¹⁰Trauma and Acute Care Surgery, Penn Medicine Lancaster General Health, Lancaster, PA; ¹¹Department of Pharmaceutical Services, Beaumont Hospital, Royal Oak, MI; ¹²Department of Pharmacy Practice, Wayne State University, Detroit, MI; ¹³Department of Urology and ¹⁴Department of Public Health, University of Helsinki and Helsinki University Hospital, Helsinki, Finland; ¹⁵Department of Orthopedic Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA; ¹⁶Department of Diagnostic, Clinical, and Public Health Medicine, University of Modena and Reggio Emilia, Modena, Italy; ¹⁷Department of Medicine and ¹⁸Center for Evidence-Based Orthopaedics, Division of Orthopaedic Surgery, McMaster University, Hamilton, ON, Canada; ¹⁹Department of Internal Medicine, School of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile; ²⁰School of Medicine, Universidad de los Andes, Bogotá, Colombia; ²¹Urology Section, Minneapolis VA Health Care System, Minneapolis, MN; and ²²Department of Urology, University of Minnesota, Minneapolis, MN

VTE Among Hospitalized Medical and Surgical Patients

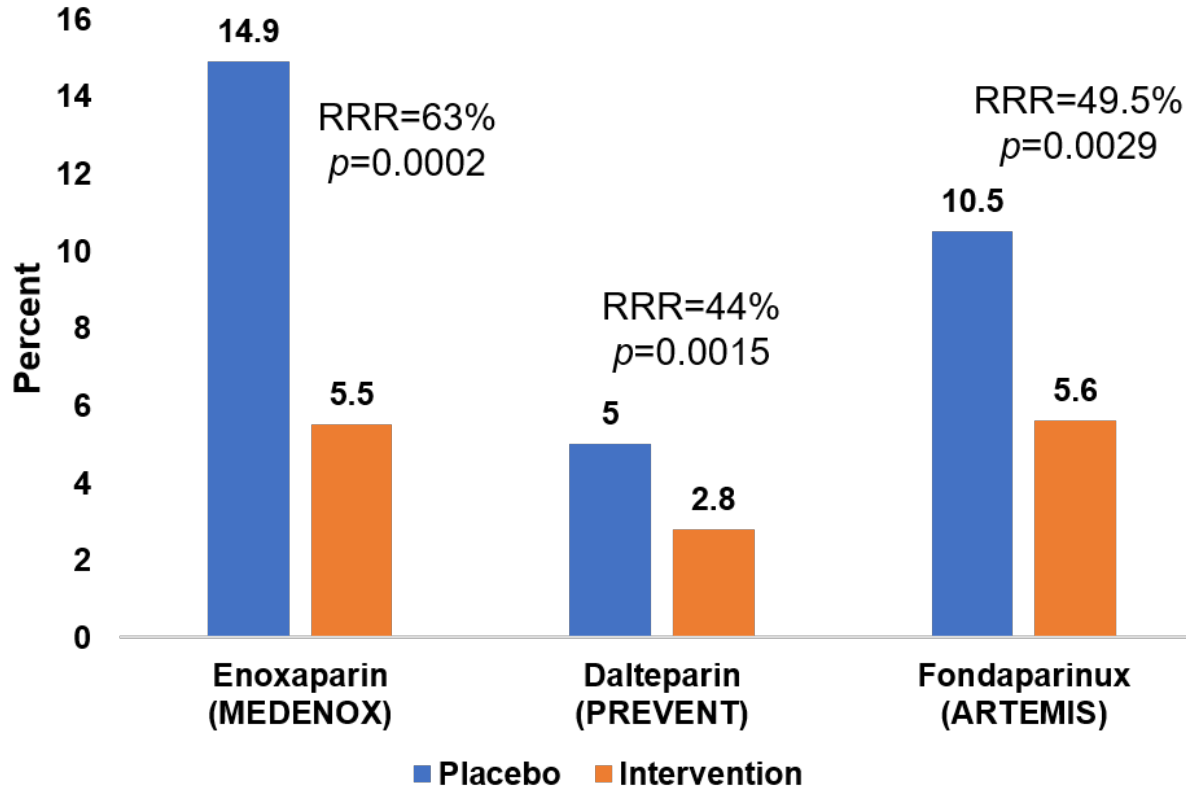
Characteristics	Hospitalized Med Patients (No., %)	Hospitalized Surgical Patients (No., %)	P Value
PE	488 (22.2)	241 (15.5)	<0.001
Proximal lower extremity & calf DVT	1,065 (40.9)	594 (30.4)	<0.001
Proximal lower extremity DVT w/o calf involvement	1,064 (40.8)	708 (36.3)	0.002
Calf DVT	335 (12.9)	391 (20)	<0.001
Upper extremity DVT	215 (8.3)	329 (16.9)	<0.001

	Medical Patients (N=756)	Surgical Patients (N=884)	OR (95% CI)	P-value
Fatal PE	27(3.6)	8(0.9)	4.1 (1.8,9.0)	<0.001

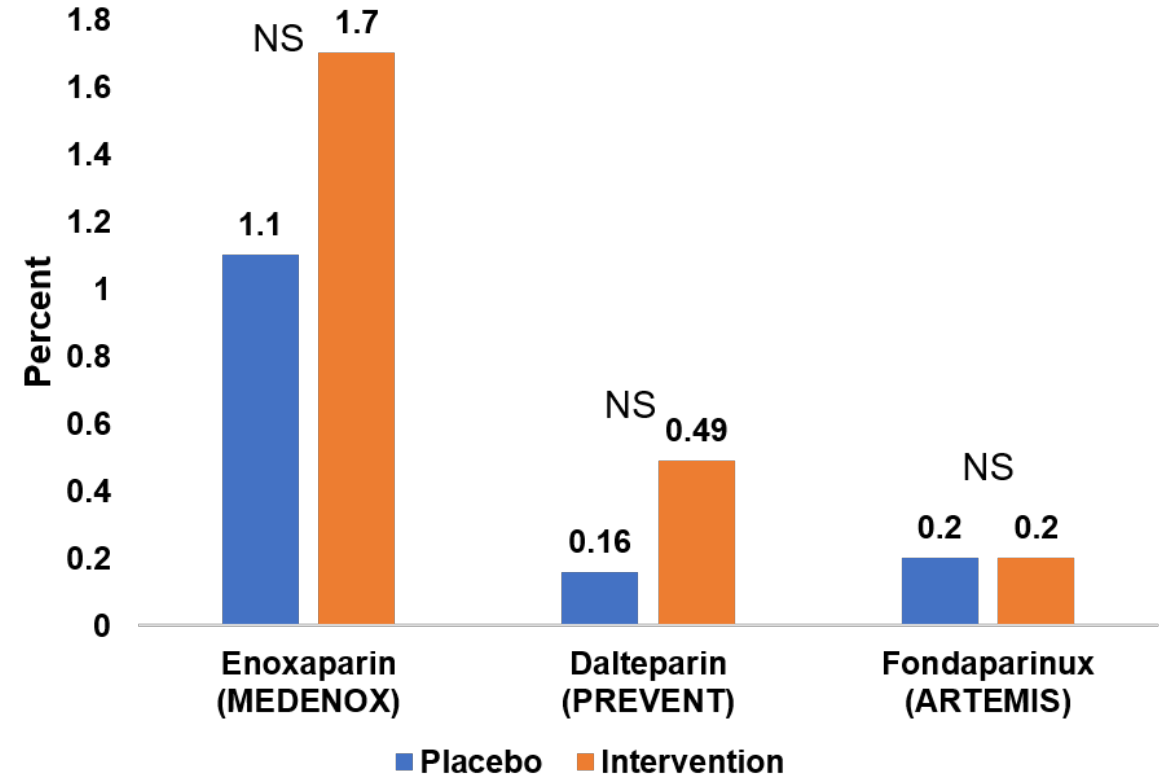
Hospitalized medical patients have more severe forms of VTE more VTE-related deaths than their surgical counterparts

Early Studies of Medically Ill VTE Prophylaxis

VTE Event Rates



Major Bleeding Rates



- Without prophylaxis, rates of any VTE at 14-15 days in acute medically ill patients were 5-15%
- All VTEs reduced 50-60% with 6-14 days prophylaxis, without increasing major bleeding

Surgeon General's Call to Action 2008

“Hospitalization... single most important risk factor for VTE...”

“PE is the most preventable cause of death among hospitalized patients...”

“Provision of prophylaxis is one of the most important things that can be done to improve patient safety...”

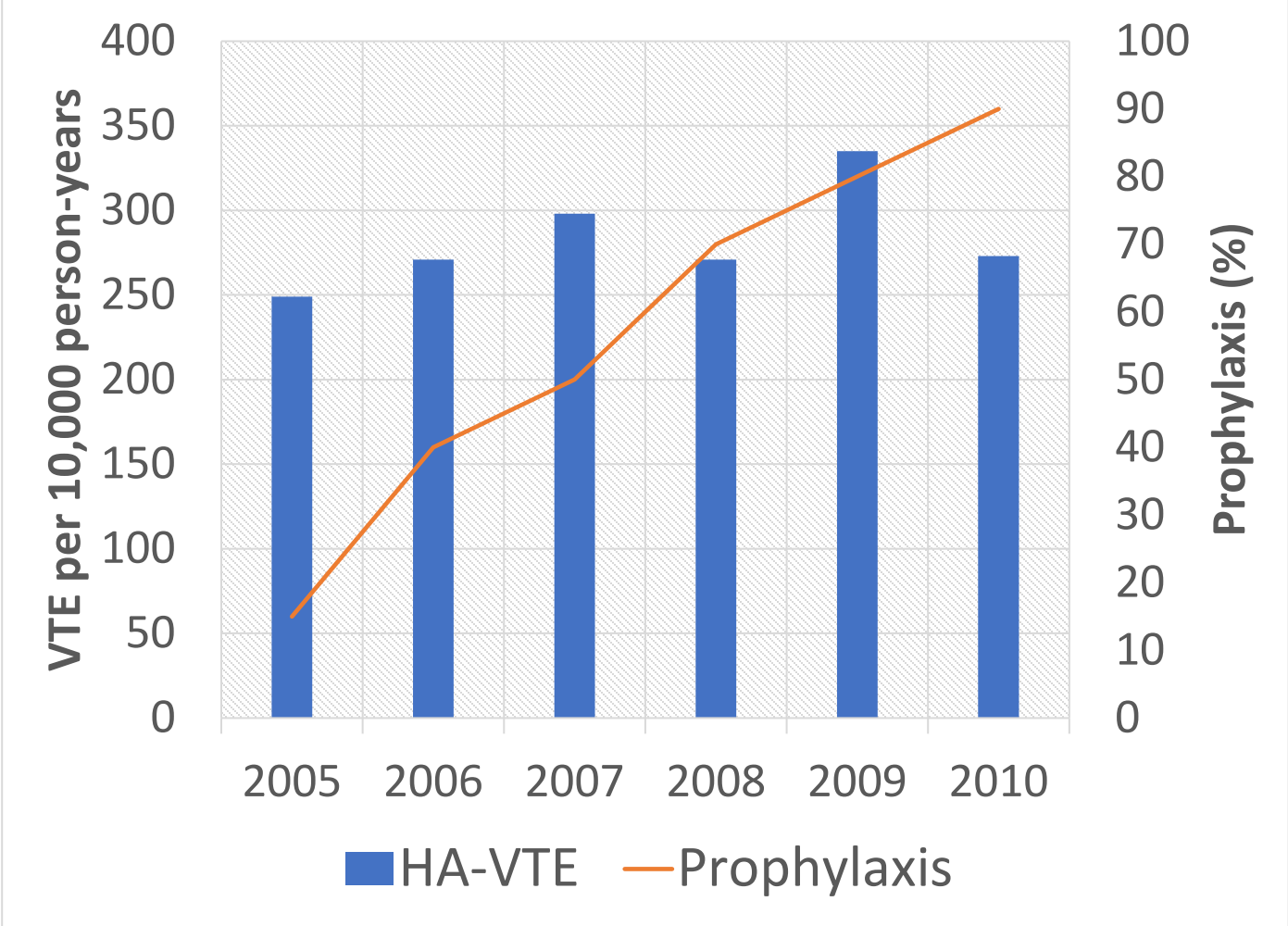
The Surgeon General's Call to Action
to Prevent Deep Vein Thrombosis
and Pulmonary Embolism

2008



U.S. Department of Health and Human Services

Impact of VTE Prophylaxis Over Time



Prophylaxis rates increased to >90%

No impact on incidence of VTE

Median length of stay (LOS): 3 days

Median duration of ppx: 70 hours

75% of hospital-associated VTE occurred after discharge

Potential Targets for Improvement



Identifying most appropriate patients to prophylax



Optimizing inpatient prophylaxis



Prophylaxing for the optimal duration of time



Better quality metrics



Anticoagulation stewardship

Identifying Patients At Increased Risk for VTE

RAM risk factors and respective weights			
<u>Kucher:</u> •Previous VTE (3) •Thrombophilia ^a (3) •Current cancer ^b (3) •Surgery (<1 mo.) (2) •Age > 70y (1) •Obesity (BMI>30) (1) •Immobile ^c (1) •Hormone therapy or oral contraceptives (1)	<u>Padua:</u> •Previous VTE (3) •Thrombophilia ^a (3) •Current cancer ^b (3) •Immobile ^c (3) •Surgery (<1 mo.) or Trauma (<1 mo.) (2) •Age > 70y (1) •Obesity (BMI>30) (1) •CHF(1) •MI (<1 mo.) or stroke (<1 mo.) (1) •Hormone therapy (1) •Sepsis, pneumonia, rheumatoid arthritis, or other acute infection ^d (1)	<u>IMPROVE:</u> •Previous VTE (3) •Thrombophilia ^a (3) •Current cancer ^b (1) •Age > 60y (1)	<u>Intermountain:</u> •Previous VTE (1) •PICC ^e (1) •Current cancer ^b (1) •Immobile ^c (1)
"At-risk" cut-point and respective percentage of at-risk patients			
At-risk (≥ 4): 10.34%	At-risk (≥ 4): 16.66%	At-risk (≥ 2): 11.71%	At-risk (≥ 1): 19.13%

- Medical patients are a very heterogeneous population
- Prophylaxing all patients not ideal
- Fewer than 50% of acutely ill medical patients 'at-risk' and need VTE prophylaxis
- Quantitative RAMs aid in selecting right patients to prophylax (and NOT prophylax)

Quantitative VTE Risk Assessment Models

IMPROVE RAM ¹ : Factors	Point(s)
Previous VTE	3

PADUA RAM ² : Factors	Point(s)
Reduced mobility	3
Active cancer	3
Previous VTE	3
Known thrombophilia	3

- 1/1/17: Centers for Medicare and Medicaid Services (CMS) mandated one of two VTE RAMs (IMPROVE and Padua) for hospital-acquired preventable VTE in medically ill (VTE-6 core measure)
- World Thrombosis Day has endorsed the IMPROVE VTE RAM for medically ill based on best available evidence
- The 2018 ASH Guidelines on VTE prevention in medically ill have endorsed both IMPROVE and Padua VTE

Score ≥ 2 = at risk	Score ≥ 4 = at risk
--------------------------	--------------------------

1) Spyropoulos AC et al. CHEST 2011; 140 (3): 706-714 2) Barbar et al. JTH 2010; 8(11): 2450-72)

Ordered Prophylaxis ≠ Administered Prophylaxis

10,516 medical and surgical admissions

5-15% of parenteral prophylaxis doses were omitted

Patient refusal most common reason at 42 – 65%

All doses	# doses ordered	Doses not given	% documented as refused
UFH	86,958	12.8%	59
Enoxaparin	16,202	6.7%	59.4
Dose & frequency			
UFH 5000U Q8H	58,299	11.8%	55.6%
UFH 5000U Q12H	28,129	15.2%	65.4%
UFH 7500U Q8H	500	6.2%	61.3%
Enoxaparin 40mg QD	12,211	7.2%	57.3%
Enoxaparin 30mg Q12H	3,991	5.1%	42.1%

Considerations for Optimizing Inpatient Adherence

Oral option (DOACs)	<p>Potential heparin shortage given the swine flu in China</p> <hr/> <p>Potentially less expensive given costs of UFH/LMWH may rise due to shortage</p> <hr/> <p>Ease of use and less risk of refusal especially if needed post-discharge</p> <hr/> <p>Less risk of heparin induced thrombocytopenia (HIT)</p>
Patient-centered educational/empowerment interventions	<p>Johns Hopkins interventional bundle (high effort, high resource utilization)¹</p> <hr/> <p>Northwell knowledge survey and education pamphlet (lower effort and cost)²</p>

1) Haut ER, et al. JAMA network Open 2018;1(7):e184741. doi:10.1001/jamanetworkopen.2018.4741

2) Nahar D, et al. Journal for Healthcare Quality, Vol. 40, No. 3, pp. 163–171

Considerations for Optimizing Inpatient Adherence

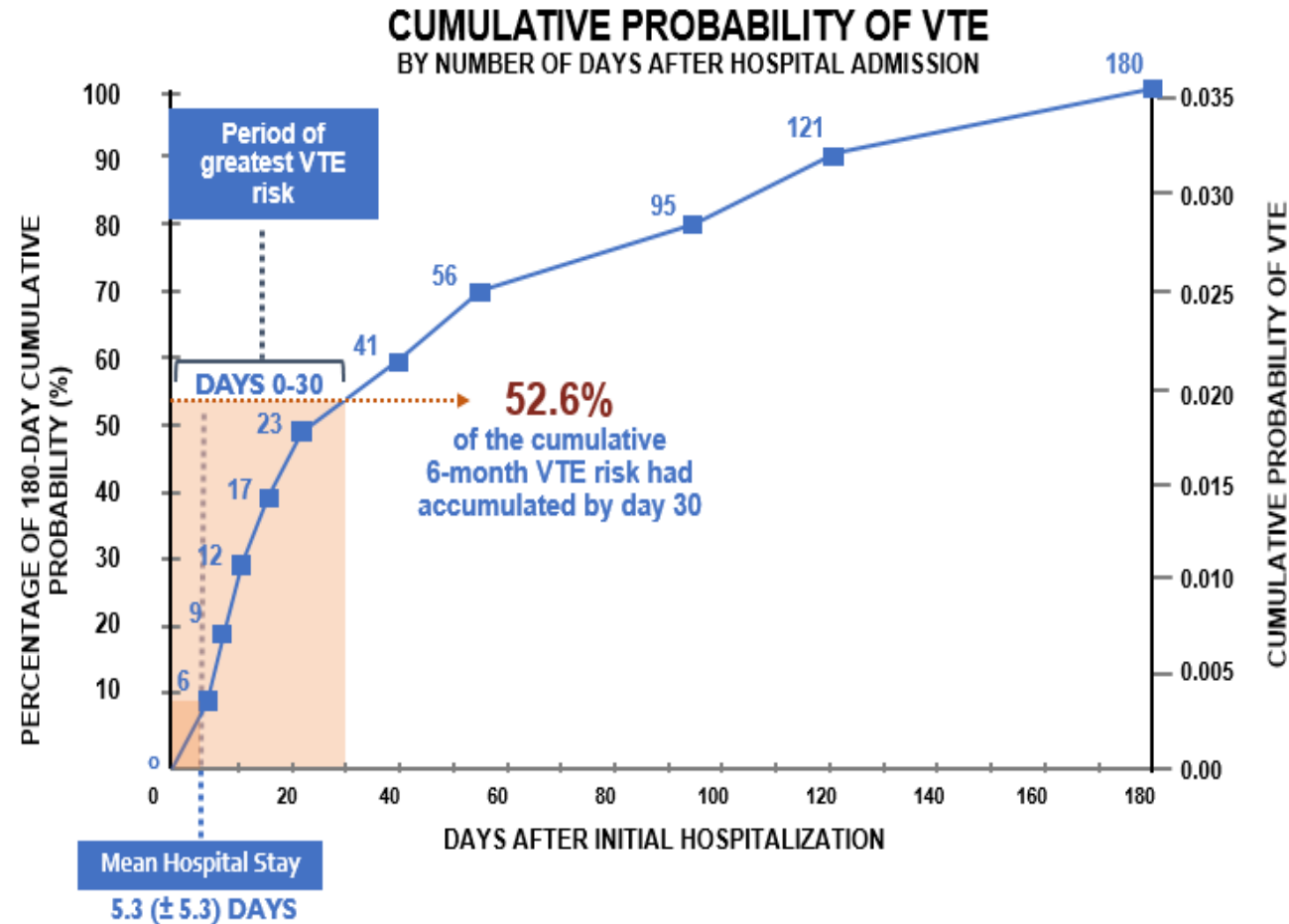
- Nursing-driven educational interventions
 - Johns Hopkins - double-blinded and nurses were cluster-randomized by hospital floor to receive a linear **Static** education module with voiceover or a **Dynamic** interactive learner-centric scenario-based education module
 - Primary and Secondary Outcomes - non-administration of prescribed VTE prophylaxis medication and nurse-reported satisfaction with education modules, respectively
 - Non-administration significantly improved following education (12.4% vs. 11.1%, conditional OR: 0.87, 95% CI: 0.80±0.95, p = 0.002)
 - Trends in reductions in non-administration were greater in the Dynamic (10.8% vs. 9.2%, OR: 0.83, 95% CI: 0.72±0.95) vs the Static arm (14.5% vs.13.5%, OR: 0.92, 95% CI: 0.81±1.03 although not significant (p = 0.26)
 - Satisfaction scores were significantly higher for nurses in the Dynamic arm (p < 0.05)

Optimal Duration of VTE Prophylaxis?

Duration of inpatient prophylaxis is shortening as the average hospital length of stay decreases

VTE risk in medical patients is elevated for 45-60 days post-discharge

Most hospital-related VTE events occur **out of hospital**, in the first month after discharge



Extended vs. Standard Duration VTE Prophylaxis

In acutely ill medical patients, extended vs. standard-duration VTE prophylaxis

40% ↓ in symptomatic VTE and VTE-related death

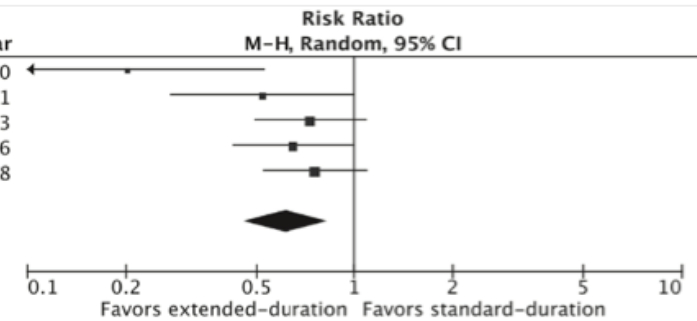
2X ↑ in major bleeding

No effect on overall mortality

Underscores the need for an individualized approach to management

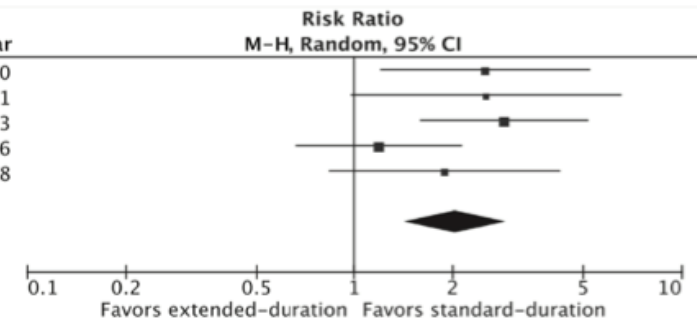
A. Symptomatic VTE or VTE-related death

Study or Subgroup	Extended-duration		Standard-duration		Weight	Risk Ratio		Year
	Events	Total	Events	Total		M-H, Random, 95% CI	Year	
EXCLAIM 2010	5	2485	25	2510	8.0%	0.20	[0.08, 0.53]	2010
ADOPT 2011	14	3255	27	3273	14.7%	0.52	[0.27, 0.99]	2011
MAGELLAN 2013	42	2967	59	3057	25.8%	0.73	[0.50, 1.09]	2013
APEX 2016	35	3721	54	3720	24.1%	0.65	[0.42, 0.99]	2016
MARINER 2018	50	6007	66	6012	27.4%	0.76	[0.53, 1.09]	2018
Total (95% CI)		18435		18572	100.0%	0.62	[0.46, 0.83]	
Total events	146		231					
Heterogeneity: Tau ² = 0.05; Chi ² = 7.25, df = 4 (P = 0.12); I ² = 45%								
Test for overall effect: Z = 3.19 (P = 0.001)								



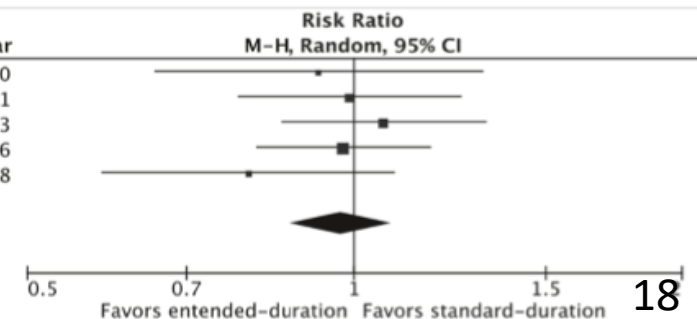
B. Major bleeding

Study or Subgroup	Extended-duration		Standard-duration		Weight	Risk Ratio		Year
	Events	Total	Events	Total		M-H, Random, 95% CI	Year	
EXCLAIM 2010	25	2975	10	2988	18.8%	2.51	[1.21, 5.22]	2010
ADOPT 2011	15	3184	6	3217	12.3%	2.53	[0.98, 6.50]	2011
MAGELLAN 2013	43	3997	15	4001	26.2%	2.87	[1.60, 5.16]	2013
APEX 2016	25	3716	21	3716	26.7%	1.19	[0.67, 2.12]	2016
MARINER 2018	17	5982	9	5980	16.1%	1.89	[0.84, 4.23]	2018
Total (95% CI)		19854		19902	100.0%	2.04	[1.42, 2.91]	
Total events	125		61					
Heterogeneity: Tau ² = 0.04; Chi ² = 5.18, df = 4 (P = 0.27); I ² = 23%								
Test for overall effect: Z = 3.90 (P < 0.0001)								



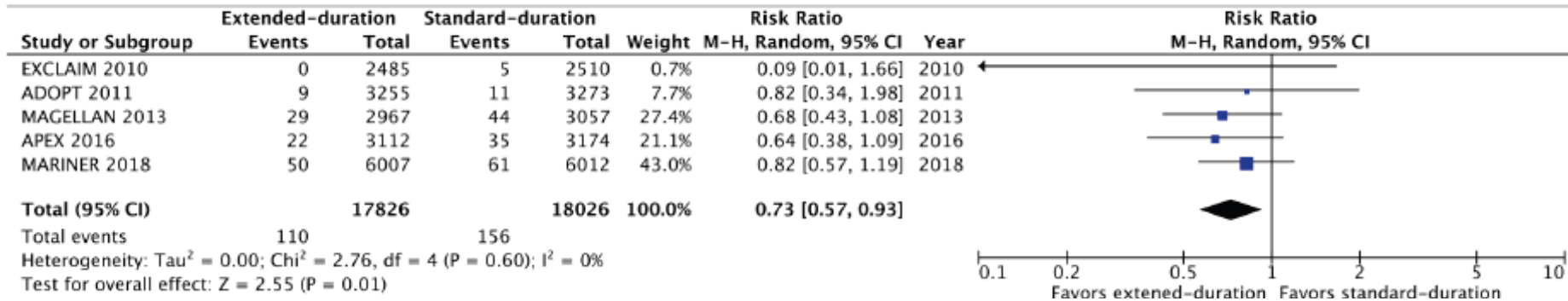
C. All-cause mortality

Study or Subgroup	Extended-duration		Standard-duration		Weight	Risk Ratio		Year
	Events	Total	Events	Total		M-H, Random, 95% CI	Year	
EXCLAIM 2010	60	2975	65	2988	9.5%	0.93	[0.66, 1.31]	2010
ADOPT 2011	131	3251	133	3266	20.5%	0.99	[0.78, 1.25]	2011
MAGELLAN 2013	159	3096	153	3169	24.5%	1.06	[0.86, 1.32]	2013
APEX 2016	210	3716	215	3716	33.6%	0.98	[0.81, 1.17]	2016
MARINER 2018	71	6007	89	6012	11.9%	0.80	[0.59, 1.09]	2018
Total (95% CI)		19045		19151	100.0%	0.97	[0.87, 1.08]	
Total events	631		655					
Heterogeneity: Tau ² = 0.00; Chi ² = 2.31, df = 4 (P = 0.68); I ² = 0%								
Test for overall effect: Z = 0.53 (P = 0.60)								

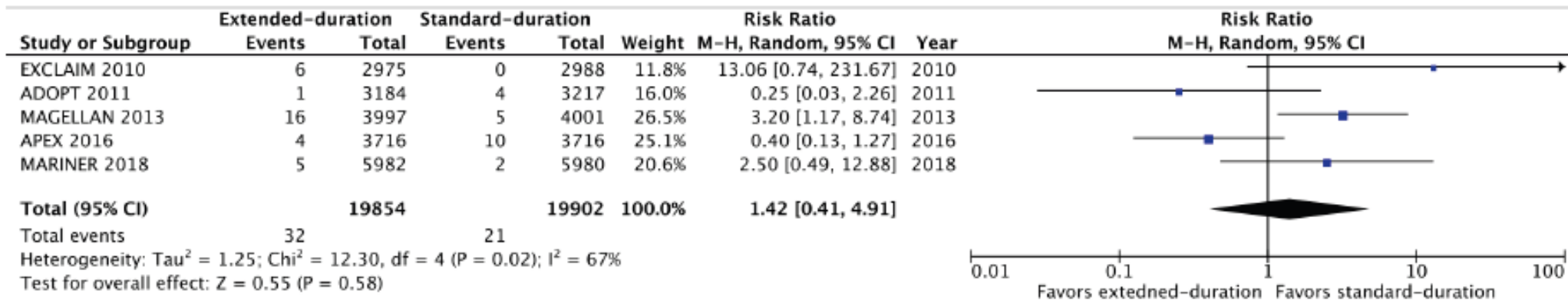


Meta-analysis of Extended Thromboprophylaxis in Medically Ill: Outcomes of Similar Clinical Severity

F. Symptomatic non-fatal PE or VTE-related death



E. Fatal bleeding or bleeding at critical site



ARR 0.25%, NNT=403

ARI 0.056%, NNH=1785



Standard LMWH vs. Extended DOAC

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

Extended DOAC prophylaxis (30-40 days) compared with shorter LMWH prophylaxis:

Outcomes	Relative effect: RR (95% CI)	Anticipated absolute effects (95% CI)	
		Risk with standard duration LMWH inpatient prophylaxis	Risk difference with extended prophylaxis with DOAC
● Mortality	1.01 (0.89 to 1.14)	49 per 1,000	0 fewer deaths per 1,000 (5 fewer to 7 more)
● 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)

Includes:
ADOPT
MAGELLAN
APEX

Quality of Evidence (GRADE): Low ● Moderate ● Strong ●

Completing the Initial Course of Therapy

- Is it reasonable to discharge patients on 6-14 days until better data available
 - More consistent with LMWH package inserts
- Example- stroke patients going to rehab or LTAC may only receive 3 days ppx in hospital and yet be at continued risk for months and often (usually) these patients don't have prophylaxis continued in post-acute facility
- Should guidelines evaluate outcomes differently with weight on bleeds placed more on fatal or critical bleeds – not all major bleeds?
- Should guidelines evaluate only FDA labeled drugs betrixaban and rivaroxaban in medical patients to minimize noise from agents not approved for extended thromboprophylaxis?

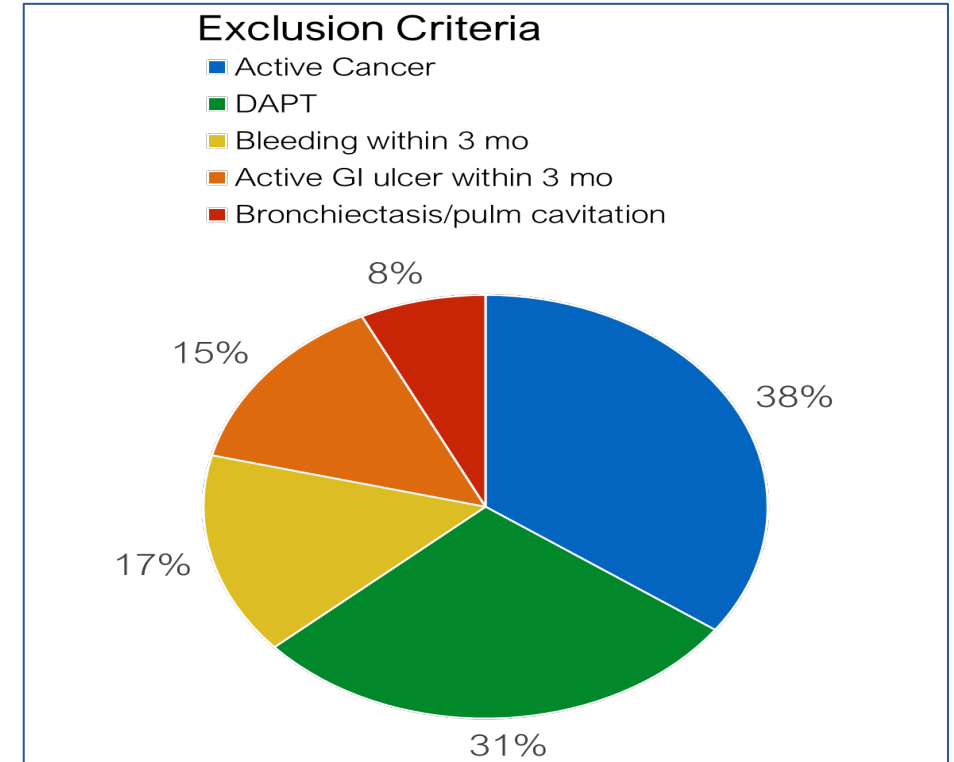
Key Exclusion Criteria Applied to MAGELLAN

Five key risk factors for major bleeding were identified and applied as exclusion criteria to MAGELLAN:

1. Active cancer
2. Dual antiplatelet therapy at baseline
3. Any bleeding within 3 months prior or during hospitalization
4. Active gastroduodenal ulcer within 3 months or currently symptomatic
5. Bronchiectasis or pulmonary cavitation

Addition of these five criteria, leaves ~80% of the overall population = MAGELLAN Subpopulation

Safety, efficacy and benefit-risk analysis were evaluated in this subpopulation.



Note: Some subjects had more than one exclusion

MARINER-like Subpopulation from MAGELLAN -Safety

	MAGELLAN			MAGELLAN subpopulation		
Safety Population*	Rivaroxaban N=3,997	Enoxaparin N=4,001	RR (95% CI)	Rivaroxaban N=3,218	Enoxaparin N=3,229	RR (95% CI)
Rivaroxaban-enoxaparin/placebo treatment phase (Day 1 to 35)*						
Clinically relevant bleeding	164 (4.1%)	67 (1.7%)	2.455 (1.854–3.251)	114 (3.5%)	49 (1.5%)	2.345 (1.685–3.264)
Major bleeding	43 (1.1%)	15 (0.4%)	2.867 (1.596–5.149)	22 (0.7%)	15 (0.5%)	1.480 (0.771–2.842)
Clinically relevant non-major bleeding	124 (3.1%)	52 (1.3%)		93 (2.9%)	34 (1.1%)	
Fatal bleeding	7 (0.2%)	1 (<0.1%)		3 (<0.1%)	1 (<0.1%)	
Rivaroxaban-enoxaparin treatment phase (Day 1 to 10)*						
Clinically relevant	111 (2.8%)	49 (1.2%)	2.272	80 (2.5%)	35 (1.1%)	2.306

The risk of major bleeding associated with rivaroxaban was reduced in both treatment phases in the MAGELLAN subpopulation

Prevent 2 to 10 major or fatal thrombotic events for every major or fatal bleed

So in the US, It is projected we can prevent non fatal and fatal PE in 24,000 patients each

year at the cost of one-fourth that number in critical/fatal bleeds

*On treatment +2 days; CI, confidence interval; RR, relative risk.

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University of New Mexico Hospital

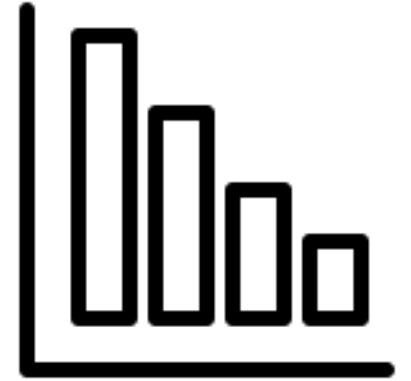


VTE Quality Measures

Measure	Status	Type	Population	What does it measure	Issue(s)
STK-1	Required for stroke center certification	Process	≥ 18y stroke	Isch. or hemorr. stroke pts who rec'd VTE ppx or doc. reason for no ppx by HD2	One-time assessment
PSI-12	Required	Outcome	≥ 18y surgical	Peri-op VTE	-In hospital VTE events only -Can occur before or after OR - No consideration of potentially preventable

*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. If evidence of receipt of any VTE prophylaxis (even single dose or single IPCD application) during this timeframe, VTE considered NON-preventable

Building Better Measures



Why do we need new, different measures?

- Old measures were not informative or beneficial
- Hospital-associated VTE incidence persists
- Hospital practice and patient care has changed (↓ LOS, potential need for extended prophylaxis)
- We need more focus on optimal VTE prevention, not less

Federally-required measures would be helpful, but that takes time

- Hospitals should implement better internal VTE prevention measures NOW

'Ideal' VTE Prevention Measures

Process measures

Documentation of standardized, quantitative risk assessment
(**Repeated at regular intervals throughout admission**)

Prescription of evidence-based, risk-appropriate VTE prophylaxis

Documented administration of appropriate prophylaxis throughout admission

Appropriate= type, dose, duration with minimal gaps in therapy (including refusals and around procedures)

Outcomes measures

Inclusion of **hospital-ASSOCIATED VTE**
(e.g. up to 30 days post-discharge)

Determination of whether VTE was **potentially preventable**

Defined as an error with any component of the process measures

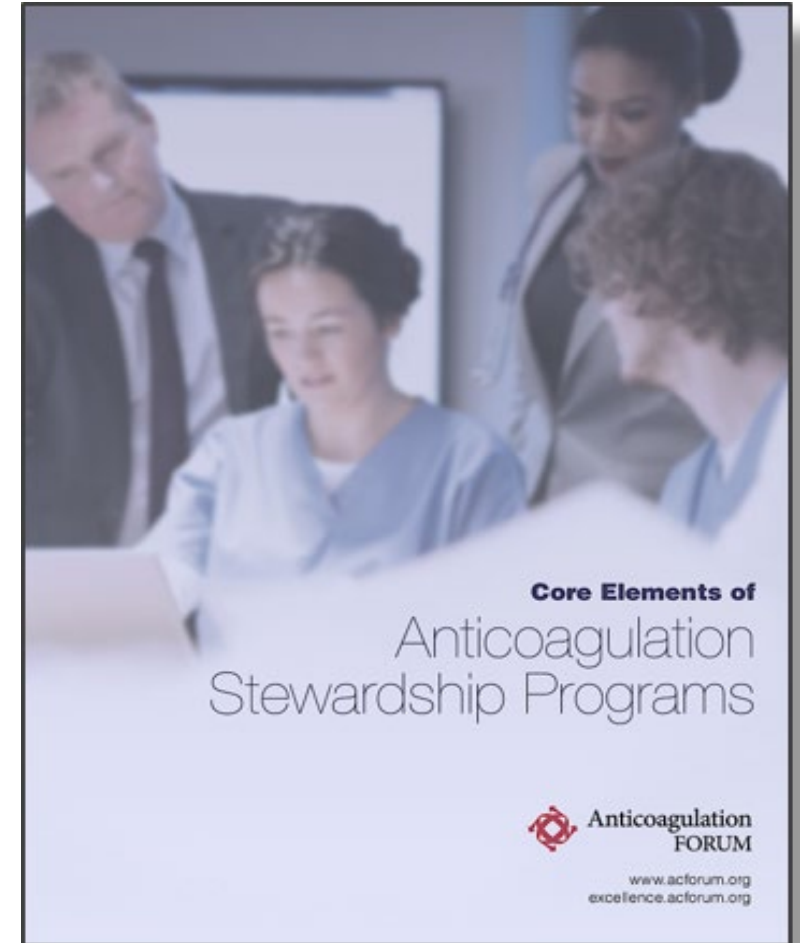
Anticoagulation Stewardship Program: Core Elements Guide

Developed through contract between AC Forum and FDA

Based on:

- Known best practices
- Calls to action for optimized use of anticoagulants in the National Action Plan for Prevention of ADEs¹
- National patient safety goals from the Joint Commission²

Outlines core elements for successful development, implementation and continued program growth



Anticoagulation Stewardship Defined

“Coordinated, efficient, and sustainable system-level initiatives designed to achieve optimal anticoagulant-related health outcomes and minimize avoidable adverse drug events through the:

- Application of optimal evidence-based care
- Appropriate prescribing, dispensing, and administration of anticoagulants and related agents
- Provision of appropriate patient monitoring and clinical responsiveness”

KEY PRINCIPLES

- Evidence-based
- Patient-centered
- Systematic
- Integrated



Core Elements of Anticoagulation Stewardship Programs

Secure Administrative Leadership Commitment

Establish Professional Accountability and Expertise

Engage Multidisciplinary Support

Perform Data Collection, Tracking, and Analysis

Implement Systematic Care

Facilitate Transitions of Care

Advance Education, Comprehension, and Competency

AC Stewardship for VTE Prevention

Secure
administrative
leadership
commitment

Align with existing quality goals and initiatives pertaining to VTE

Leverage NPSG 03.05.01 as a starting point if needed (EP-1)

Use data to support requests for resources

Establish
accountability and
expertise

Program champion- any discipline with interest/knowledge in VTE

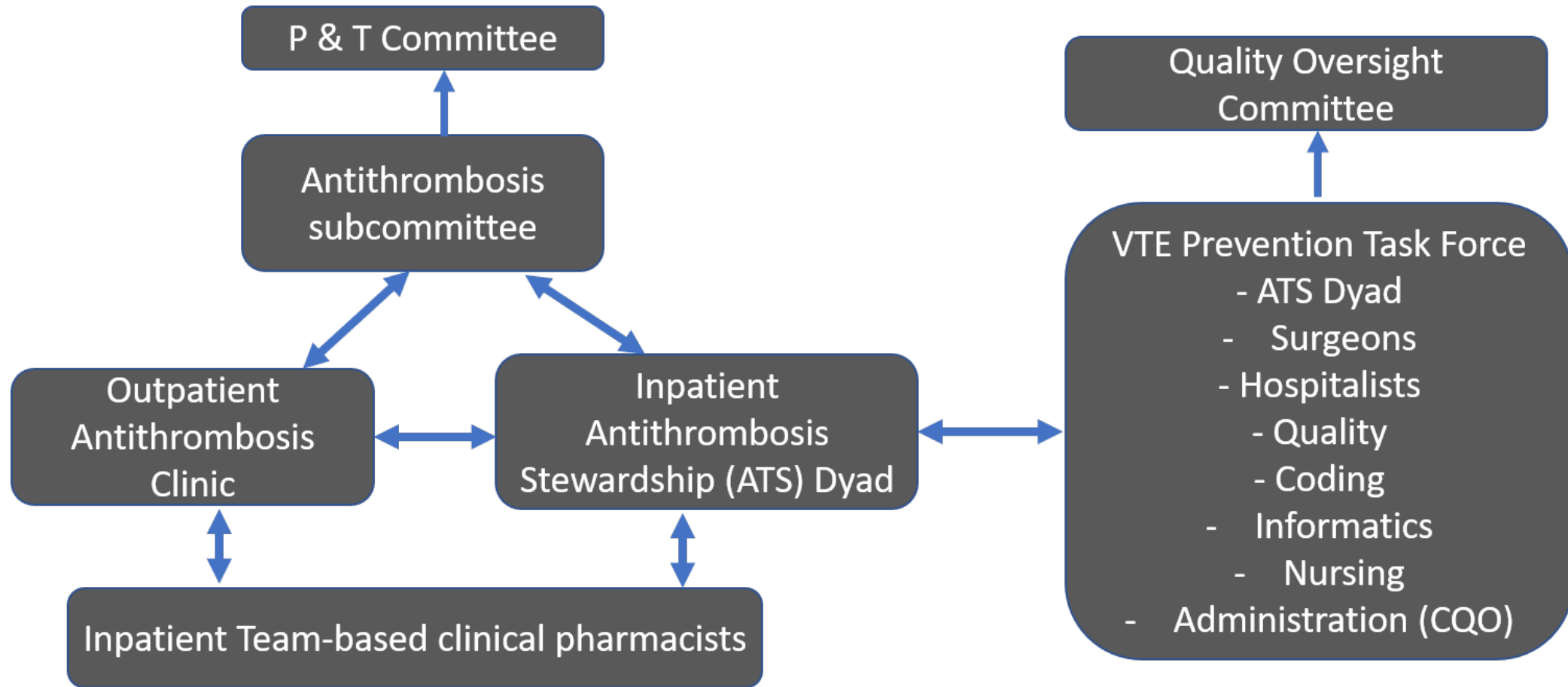
Experts to support champion and drive day-to-day efforts

Engage
multidisciplinary
support

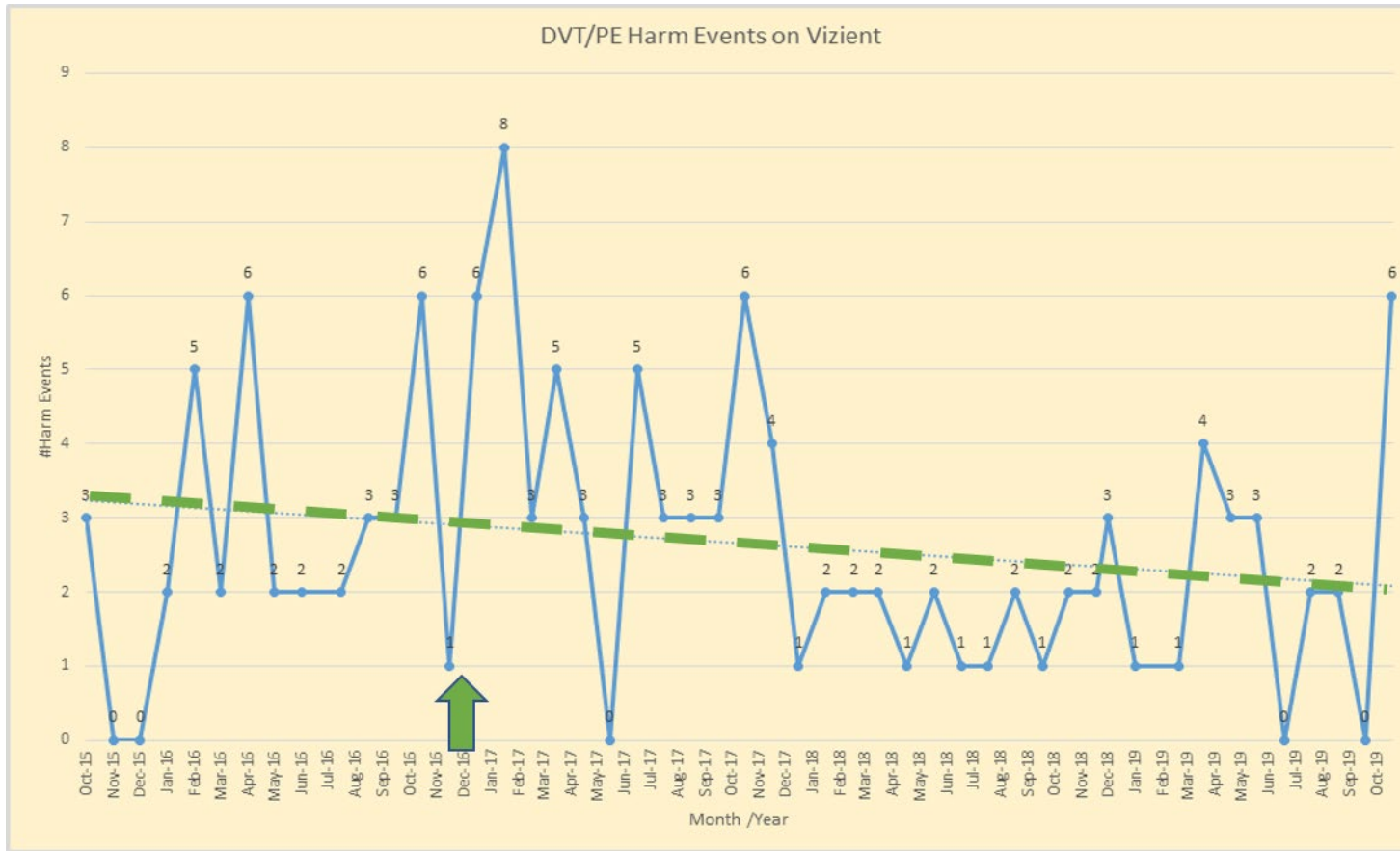
IT, quality, data analysts, lab, nursing, etc

Shared stewardship across the hospital

UNMH Approach



UNMH VTE Prevention Task Force



- Multidisciplinary group (additionally) tasked with PSI-12 in Fall '16
- Developed infrastructure/standardized review process
- REDCAP database
- Out of lowest quartile by FY '18

Perform Data Collection, Tracking and Analysis

PSI-12 efforts reduced reported harm events by almost 40%

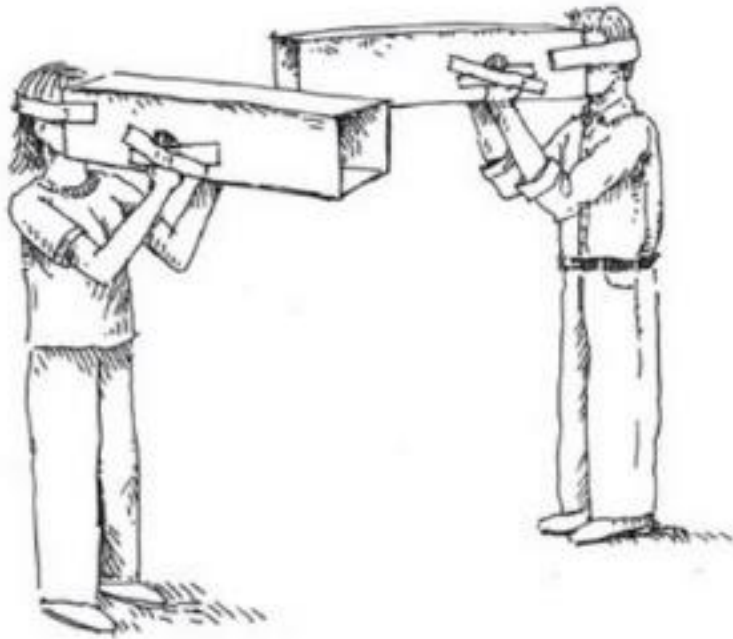
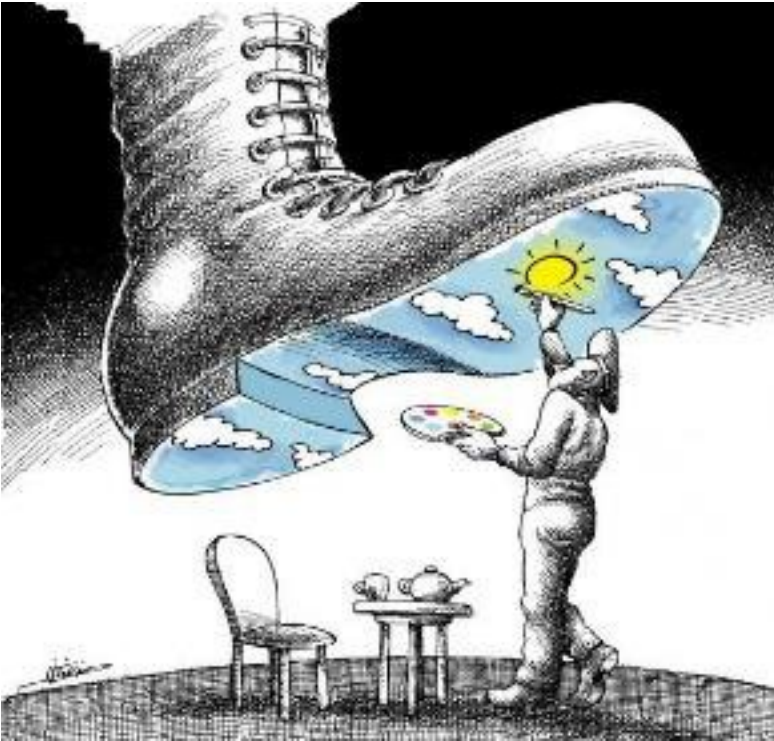
Many due to suboptimal coding and documentation

Identified key areas for clinical intervention among finite population of surgical patients

- Delayed initiation and resumption of prophylaxis
- Suboptimal adherence with SCDs

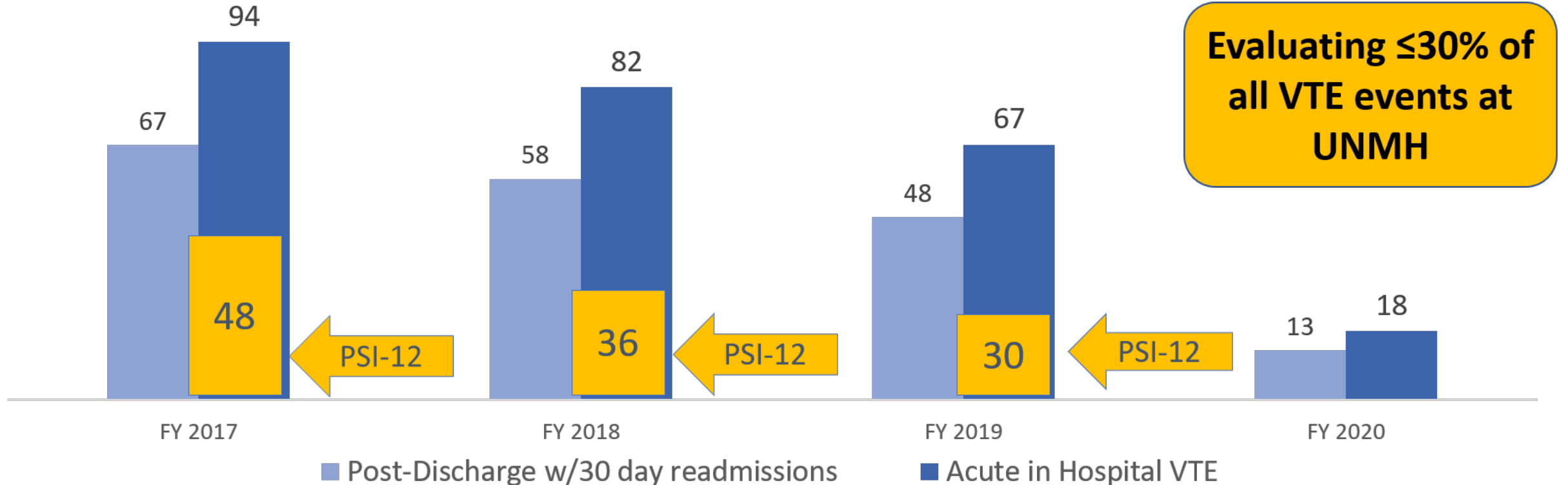
Approximately 1/3 of true events that occurred during admission were potentially preventable

UNMH VTE Prevention Task Force

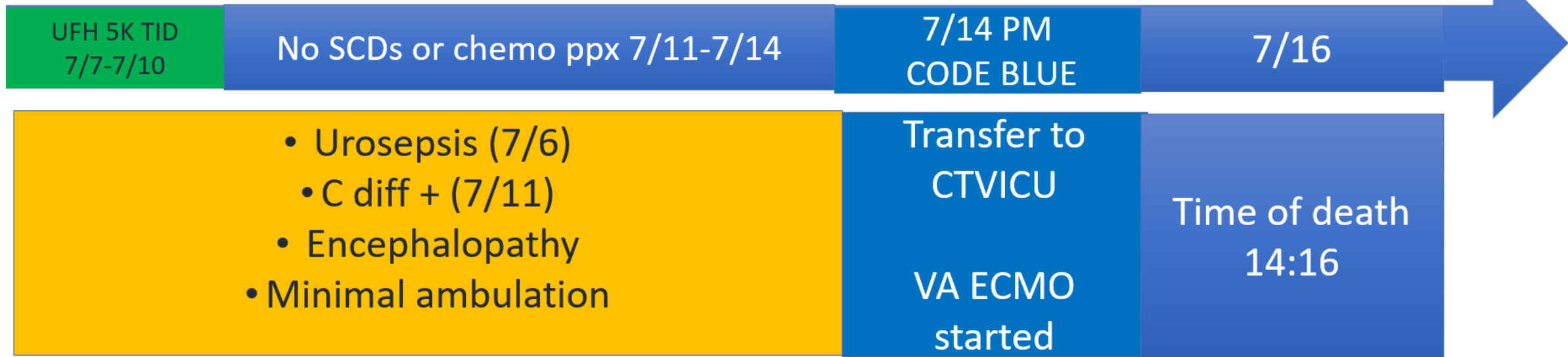


Perform Data Tracking, Collection and Analysis

Acute in-Hospital VTE and Post-Discharge VTE w/30 day Readmissions
(FY 2017 through FY 2020)



A compelling patient story doesn't hurt...



Non-surgical patient- identified through evaluation of non-PSI-12 VTE events

Presented to quality and administrative leadership at mortality committee

Reallocation of partial FTE to aid in data queries and project management

Additional 1.0 FTE approved to aid in data collection, database management and case reviews

Implement Systematic Care

- Standardized VTE RAM
- Embed in all admission order sets
- Use discrete data fields
- Next level:
 - Autopopulate
 - Forced assessment (and re-assessment)
 - Real-time alerts to providers for deficiencies

IMPROVE VTE Risk Assessment - Test, Pharm1

IMPROVE VTE Risk Assessment

VTE Risk Factor	VTE Risk Score	
<input type="radio"/> Previous VTE	3	VTE-venous thromboembolism
<input type="radio"/> Known thrombophilia	2	Thrombophilia-a congenital or acquired condition leading to excess risk of thrombosis (e.g. factor V Leiden, lupus anticoagulant, factor C or factor S deficiency)
<input type="radio"/> Current lower limb paralysis or paresis	2	Lower limb paralysis or paresis-legs falls to bed by 5 seconds, but has some effort against gravity (taken from NIH stroke scale)
<input type="radio"/> History of cancer	2	Cancer (excluding non-melanoma skin cancer) present at any time in the last 5 years
<input type="radio"/> ICU stay	1	ICU-intensive care unit
<input type="radio"/> Complete immobilization >= 1 day	1	Immobilization-confined to bed or chair with or without bathroom privileges
<input type="radio"/> Age >= 60 years	1	
<input type="radio"/> None	0	

IMPROVE VTE Risk Score

Cerner **High Risk - Medical / Non-Surgical**

IMPROVE
5

- Patient is at moderate/high risk for VTE.
- Consider VTE prophylaxis with one of the pharmacologic agents below OR SCDs if pharmacologic agents are contraindicated.
- If the patient has indication for fondaparinux (pork allergy, religious beliefs precluding pork products, active/recent HIT, etc.), please call pharmacy for assistance in ordering that medication.

U
S

Add orders for:

- No Prophylaxis (RX or SCDs) at this time due to medical or other reason
- enoxaparin - prophylaxis dosing. -> 40 mg, injection, Subcutaneous, q 24 hours
- heparin injection -> 5,000 Units, injection, Subcutaneous, q 8 hours/alternate
- SCD (below knee) -> While in bed

OK

Implement Systematic Care

VTE ppx dashboard

'Information radiators' on units

Global awareness

Promotes shared stewardship

Rapid drill down on deficits

Tie into surgical scheduling to capture cancelled procedures

Quality/Safety View				
<input type="checkbox"/>	VTE Risk	Pharmacologic VTE Prophylaxis	SCD Order	Cancelled Surgery
Patients (35 Items)				
<input type="checkbox"/>	Very Low (Med)	not given yet - enoxaparin	Yes	
<input type="checkbox"/>	Very Low (Med)	none - Ambulate	No	
<input type="checkbox"/>	Very Low (Med)	enoxaparin 40 mg 00.6hrs - current Y	No	
<input type="checkbox"/>	Mod (Med)	none - Below the Knee Intermittent Pneumatic Co	Yes	
<input type="checkbox"/>	No Score	apixaban 5 mg 00.9hrs - current Y	No	
<input type="checkbox"/>	Low (Med)	enoxaparin 40 mg 06.7hrs - current Y	No	
<input type="checkbox"/>	Mod (Med)	none - Below the Knee Intermittent Pneumatic Co	Yes	
<input type="checkbox"/>	Very Low (Med)	none - Ambulate	No	
<input type="checkbox"/>	Low (Med)	none - Below the Knee Intermittent Pneumatic Co	Yes	
<input type="checkbox"/>	No Score	heparin 5000 Units 04.1hrs - current Y	Yes	
<input type="checkbox"/>	No Score	enoxaparin 80 mg 14.4hrs - current Y	Yes	08-MAR-2020 13:00:00
<input type="checkbox"/>	Very Low (Med)	enoxaparin 40 mg 16.3hrs - current Y	No	
<input type="checkbox"/>	Very Low (Med)	none - Ambulate	No	
<input type="checkbox"/>	Low (Med)	none - Below the Knee Intermittent Pneumatic Co	Yes	
<input type="checkbox"/>	Low (Med)	none - Below the Knee Intermittent Pneumatic Co	Yes	
<input type="checkbox"/>	Very Low (Med)	none - Below the Knee Intermittent Pneumatic Co	Yes	
<input type="checkbox"/>	Low (Med)	enoxaparin 30 mg 66.1hrs - current Y	Yes	
<input type="checkbox"/>	Mod/High (Sur)	enoxaparin 40 mg 01.4hrs - current Y	No	01-MAR-2020 09:49:00
<input type="checkbox"/>	Very Low (Med)	none - Ambulate	No	
<input type="checkbox"/>	Low (Med)	heparin 5000 Units 04.5hrs - current Y	No	
<input type="checkbox"/>	Mod (Med)	enoxaparin 40 mg 12.5hrs - current Y	No	
<input type="checkbox"/>	Very Low (Med)	enoxaparin 40 mg 17.7hrs - current Y	No	
<input type="checkbox"/>	Very Low (Med)	enoxaparin 40 mg 14.2hrs - current Y	Yes	
<input type="checkbox"/>	No Score	enoxaparin 60 mg 21.8hrs - current Y	No	
<input type="checkbox"/>	No Score	enoxaparin 40 mg 13.9hrs - current Y	No	03-MAR-2020 07:30:00
<input type="checkbox"/>	No Score	heparin 5000 Units 61.5hrs - current Y	No	
<input type="checkbox"/>	Low (Med)	heparin 5000 Units 04.0hrs - current Y	No	
<input type="checkbox"/>	Low (Med)	apixaban 5 mg 01.5hrs - current Y	No	
<input type="checkbox"/>	Low (Med)	enoxaparin 40 mg 20.7hrs - current Y	Yes	
<input type="checkbox"/>	Mod/High (Sur)	none - aspirin EC ortho VTE prophylaxis	No	06-MAR-2020 19:00:00
<input type="checkbox"/>	Low (Med)	enoxaparin 40 mg 03.7hrs - current Y	No	



Advance Education, Comprehension and Competency

- Mandatory online annual competency for providers, RNs, pharmacists
- Patient education handout in all admission packets
 - 6th-grade reading level
 - Multiple languages

VTE Prevention at UNMH


The information contained in this module is maintained and reviewed annually by educators.

Efforts were made to present the following content in an accurate, clear, and concise manner while maintaining compliance with acceptable standards of care. Your comments and concerns are important to us.

Please do not hesitate to provide feedback or identify errors, omissions or deficiencies in the content or presentation of this important subject matter.

This module was last updated November 2019

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How can I protect myself from blood clots?

When you come to the hospital, your medical team will estimate at your risk of getting a blood clot.

If you are at risk, there are 2 main ways to try to prevent you from getting a blood clot:


- Small doses of blood thinners that are given as shots in your stomach (usually medicine called heparin or Lovenox)
- Use of a machine called "SCDs" that squeezes your calves.

If your risk is very high, your medical team may want you to have both.

How do SCDs help?

SCDs improve blood flow in the legs. They have "sleeves" that wrap around your legs. One sleeve fills up with air and squeezes the leg, and then the other side does the same thing. The sleeves make the veins in your legs work like they do when you are walking. This helps prevent blood clots.

- You should wear your SCDs any time you are in bed or sitting in a chair.
- You must take off your SCDs for walking.
- It's best for you to be out of bed as much as you are in bed. Walk in the halls at least 3 times per day if your doctor approves.
- Ask for help to take off the SCDs before you get out of bed and help to put them back on.



**Remember to wear your SCDs!
Don't be afraid to ask staff to put your SCDs back on.**

UNM HOSPITALS

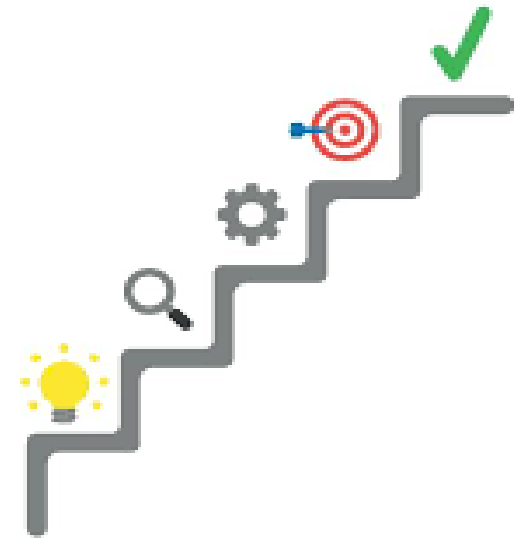
Next Steps at UNMH

Short term goals

- Baseline metrics
 - Incidence of refusals and implementation of targeted interventions
 - Percent of patients with standardized VTE risk score
- Information radiators on units
- Optimize REDCAP database and data management

Longer-term goals

- Real-time review of all in-hospital VTE events
- On demand VTE events statistics with attribution by location/service
- Prepare for wider-spread adoption of extended prophylaxis as more data becomes available
 - Enhanced transitions of care
- Minimize potentially preventable hospital-associated VTE events



VTE Prophylaxis Stewardship Actions You Can Take Right Now

Determine rates of hospital-associated VTE (quality, leadership likely already have these numbers)

- If suboptimal, petition for resources

Choose VTE RAMs for use in your medical and surgical patients

- Build using discrete data fields and embed in workflow
- Measure % of patients with VTE risk assessment

Build discrete data fields into your EHR to track prophylaxis refusals (mech. and RX)

Develop and implement VTE prevention education tools for healthcare staff and patients/caregivers



Areas for Future Research in VTE Prevention

What is the optimal risk assessment model for identifying at-risk patients?

Optimal prophylaxis dosing for obese, underweight, renal patients?

What is the role and impact of enhanced patient awareness and engagement?

Is there a role for combined prophylactic (mech and RX) modalities to minimize gaps in care?

DOACs for inpatient use/standard duration only vs. extended prophylaxis?



Take Home Points

The incidence of hospital-associated VTE remains a significant clinical challenge

The evidence for extended VTE prophylaxis in medical patients continues to evolve and may lead to significant changes in practice

With suboptimal existing VTE quality measures, many of which are being retired, hospitals likely need to institute more meaningful internal VTE prevention measures

Anticoagulation stewardship core elements can provide a beneficial framework and roadmap for development and implementation of VTE prevention programs

