collaboration innovation community teamwork patient centered quality improvement knowledge sharing

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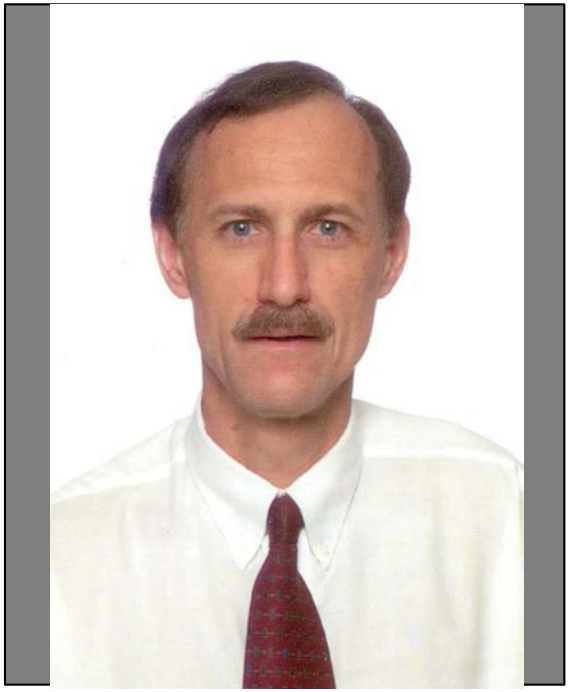
VTE Virtual Learning Series #1:

Preventing VTE: Evidence and Execution

Hosted by:
Shari McKeown, RRT, FCSRT, MA
Quality Leader, BC Patient Safety & Quality Council
smckeown@bcpsqc.ca

Our presenters today:



Dr. Bill Geerts

Dr. Steve Ligertwood

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Dr. Bill Geerts is a Professor of Medicine at the University of Toronto. He is also the Director of the Thromboembolism Program at Sunnybrook Health Sciences Centre in Toronto. His clinical practice is restricted to venous thromboembolism and his academic interests involve the diagnosis, treatment, and prevention of thromboembolic disease, as well as guideline implementation and quality of care improvement. For 10 years, he was chair of the Prevention of Venous Thromboembolism section of the ACCP Guidelines on Antithrombotic Therapy. He is currently the leader of the *Safer Healthcare Now!* initiative to improve the use of thromboprophylaxis across Canada.

Dr. Steve Ligertwood is a Hospitalist at the Royal Columbian Hospital (RCH), and the Regional Hospitalist Department Head for the Fraser Health Authority(FHA). Over the past 3 years he has more formally focused on his interest in QI and patient safety. He is the Physician Lead for the B.C. Hospitalist VTE Prevention Collaborative. This QI collaborative involves over 1600 patients in 11 different Hospitalist programs across the province.

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Objectives:

1. Review the rationale and evidence for VTE prophylaxis
2. Learn recommendations for national implementation strategies
3. How to achieve your local goals – what works, what doesn't, and why

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Preventing VTE: Evidence and Execution
BCPSQC - Dec. 1, 2011

Rationale and National Implementation Strategies

Bill Geerts, MD, FRCPC
Thromboembolism Specialist, Sunnybrook HSC
Professor of Medicine, University of Toronto
National Lead, VTE Prevention, *Safer Healthcare Now!*

Sunnybrook HEALTH SCIENCES CENTRE

U of T

safer healthcare now!

What's New in Thromboprophylaxis?

Participant Question

At your hospital, do 100% of patients at risk for VTE receive appropriate prophylaxis 100% of the time?

- ☐ Yes
- ☐ No

Rationale for Thromboprophylaxis

1. VTE is common in hospital patients
2. VTE is bad (acutely and long-term)
3. VTE is preventable (safely and inexpensively)
4. Preventing VTE is standard of care for almost all hospital patients in 2011

Risk Factors for VTE

- **Previous DVT or PE**
- **Increased age**
- **Surgery**
- **Trauma** - major, local leg
- **Immobilization** - bedrest, stroke, paralysis
- **Cancer and its treatment** (CTX, RTX, hormonal)
- **Acute medical illness**
- **Estrogen use** (BCP, HRT**), pregnancy, postpartum**
- **Central venous lines**
- **Blood clotting disorders (thrombophilia)**

Risk Factors for VTE

- **Previous DVT or PE**
- **Increased age**
- **Surgery**
- **Trauma** - major, local
- **Immobilizati** ...alysis
- **Can** ...CTX, RTX, hormonal)
- **Acu** ...ss
- **Estro** ...se (BCP, HRT**), pregnancy, postpartum**
- **Central venous lines**
- **Blood clotting disorders (thrombophilia)**

Almost all hospital patients are at risk for VTE and most have multiple risk factors

Symptomatic VTE after Surgery

- California Patient Discharge Database (N = 1,653,275)
- VTE during surgical admission or within 3 mos

Benign disease		Malignant disease	
THR	2.4 %	Craniot/excision	3.6 %
Craniot/excision	2.3 %	Colectomy	1.7 %
TKR	1.7 %	Pneumonectomy	1.6 %
CABG	1.1 %	Rad prostatect	1.5 %
Colectomy	1.1 %	Hysterectomy	1.2 %
Hysterectomy	0.3 %	Mastectomy	0.4 %

For major surgery, symptomatic VTE in 1-4% of patients

White - Thromb Haemost 2003;90:446

Fatal PE after Surgical Procedures

- Double-blind RCT of LDH TID and certoparin QD
- Autopsy-proven fatal PE during prophylaxis + 14 days

Procedure	No.	Fatal PE
Hip fracture	607	4 (0.7%)
Colorectal	2,256	8 (0.4%)
Upper GI surgery	1,317	4 (0.3%)
Thoracic	1,057	2 (0.2%)
THR/TKR	412	1 (0.2%)
Gallbladder	4,292	2 (0.05%)

Haas – Thromb Haemost 2005;94:814

We should keep in mind that . . .

- ~60% of all VTE is **hospital-acquired**
- PE is the commonest preventable cause of **hospital death**
- Thromboprophylaxis is the **number 1 ranked patient safety strategy** in hospitalized patients

Making Health Care Safer: A Critical Analysis of Patient Safety Practices - Shojania (2001) - www.ahrq.gov/clinic/ptsafety/

We also need to be aware that . . .

- More than 430 randomized studies prove that **VTE CAN be prevented** safely and inexpensively

- **Guidelines** have recommended routine prophylaxis use for 25 years

Burden of Hospital-Acquired VTE

Population of B.C. 2011
4,564,000

1/1,000/yr

Annual VTE rate
4,564

60%

Hospital-acquired VTE rate
2,700/year

Thromboprophylaxis Shown to Reduce Mortality after Hip Fracture 52 years ago!!

- 1st randomized trial of thromboprophylaxis

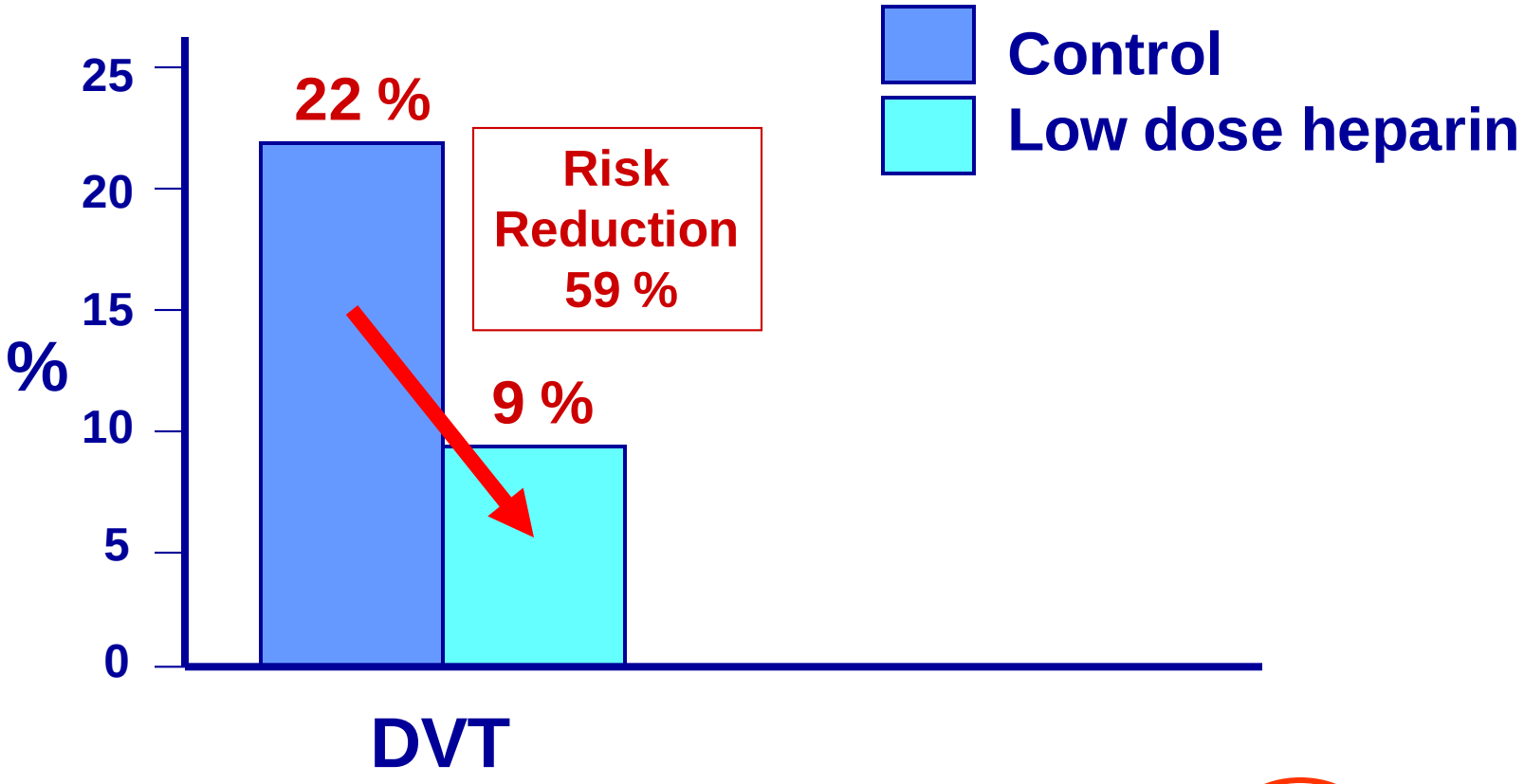
	Controls n=150		Phenindione* n=150	NNT
Symptomatic DVT	29 %	>>	3 %#	4
Symptomatic PE	5 %	>>	0	20
Total deaths	28 %	>>	17 %	9

* from admission to ambulation (~5 weeks); PT 25-40 sec

all after phenindione stopped

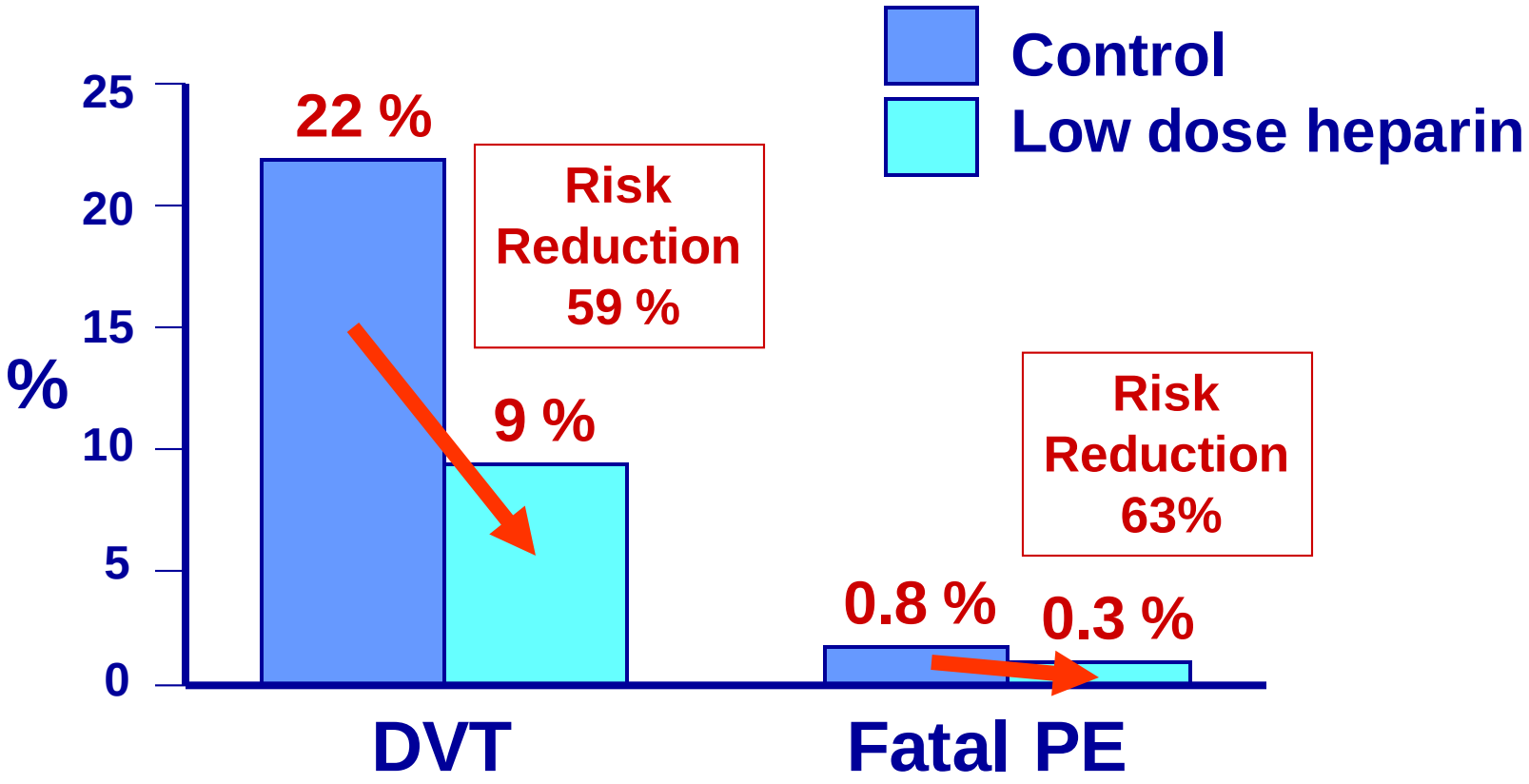
Sevitt & Gallagher – Lancet 1959;2:981

Thromboprophylaxis Reduced DVT in 46 RCTs of Surgical Patients (n=15,598)



Collins – NEJM 1988;318:1162

Thromboprophylaxis also Reduced Fatal PE in Surgical Patients



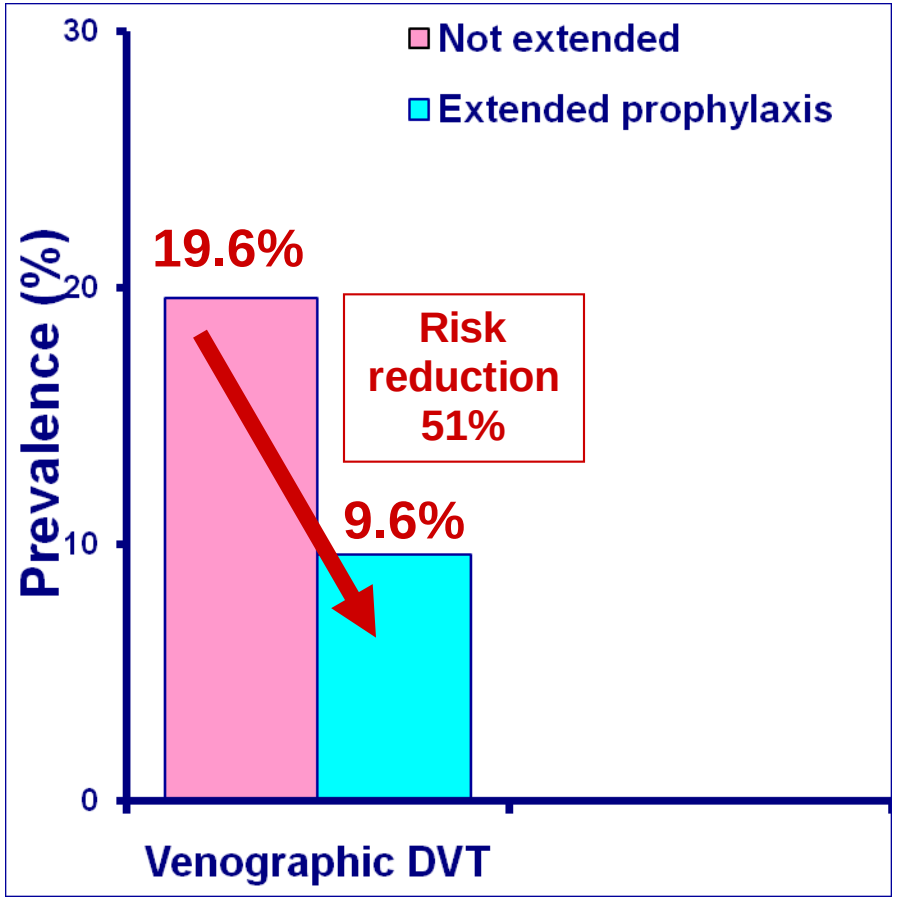
Collins – NEJM 1988;318:1162

Extended Thromboprophylaxis Reduces DVT after THR

Meta-analysis:

9 THR studies

N = 3,999



Eikelboom - Lancet 2001;358:9

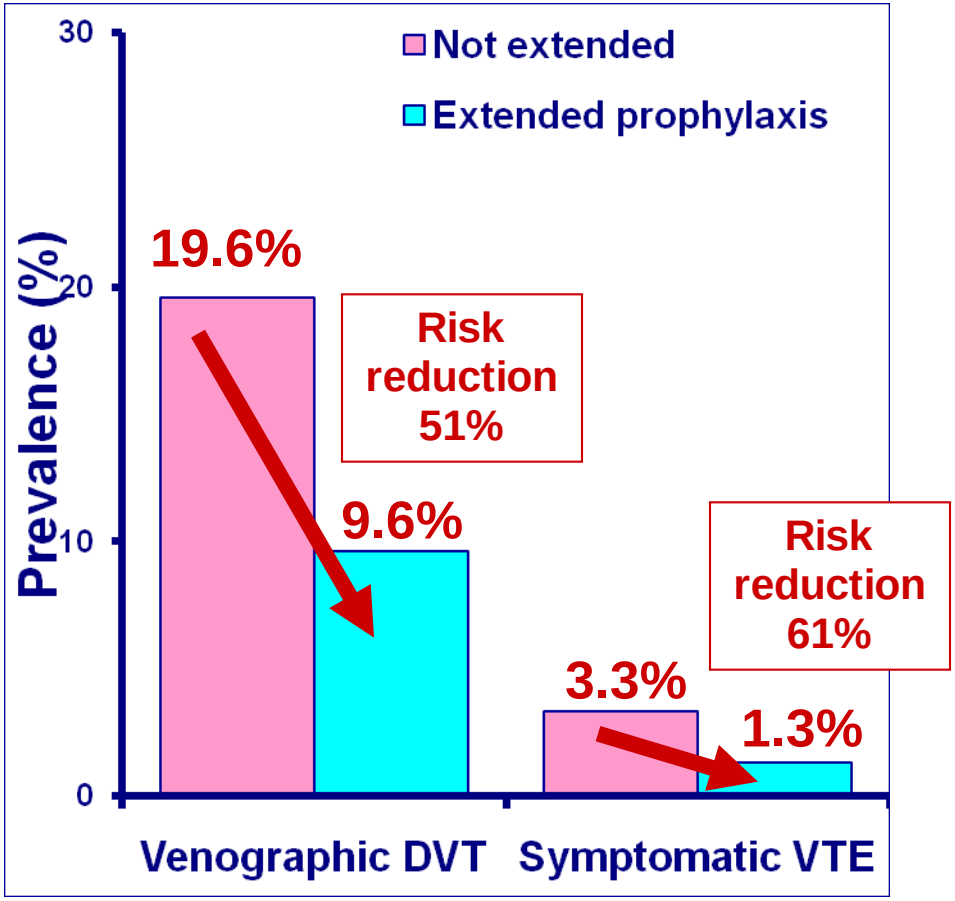
Extended Thromboprophylaxis Reduces DVT and Symptomatic VTE

Meta-analysis:

9 THR studies

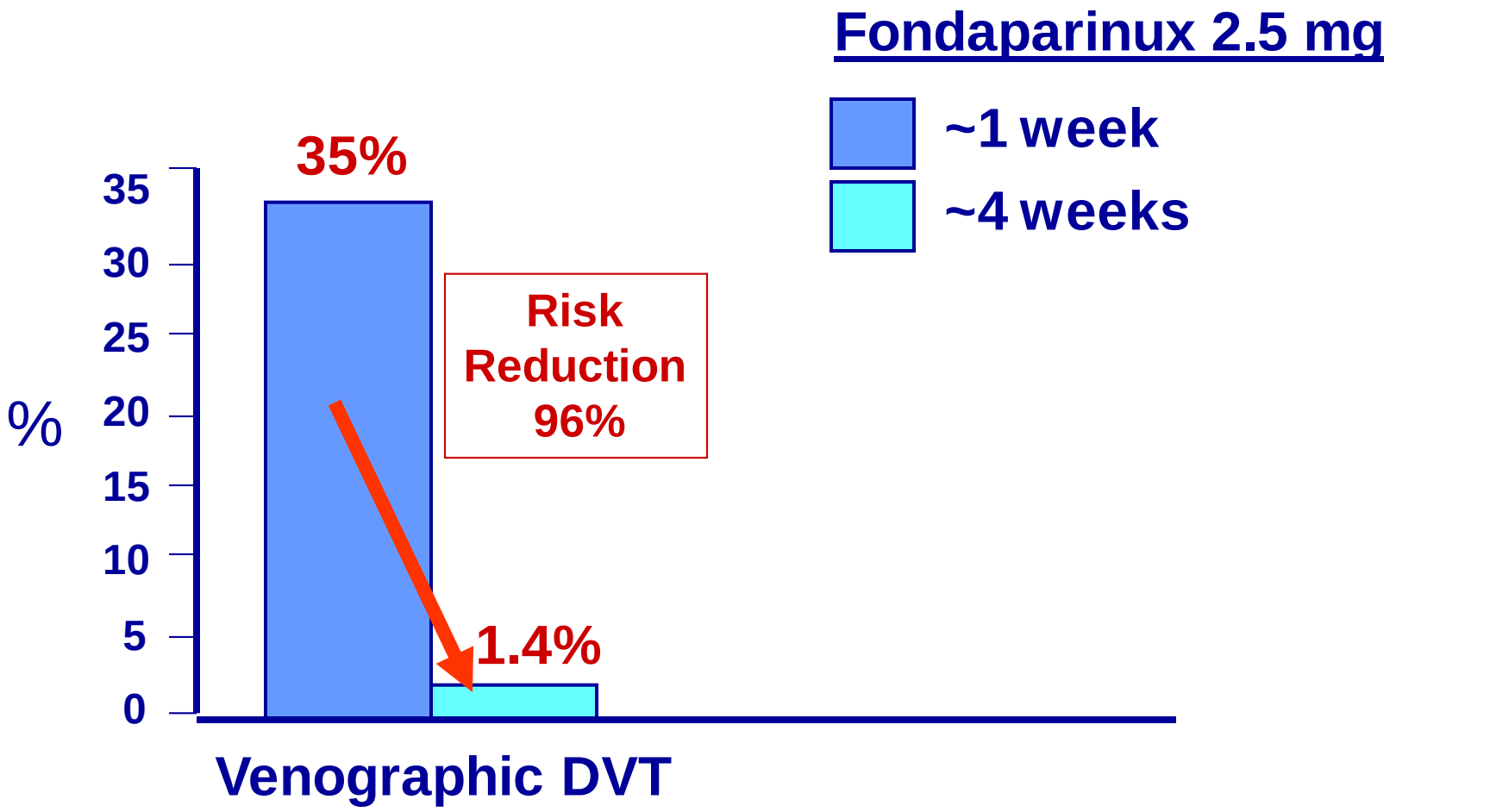
N = 3,999

No post-discharge major bleeding



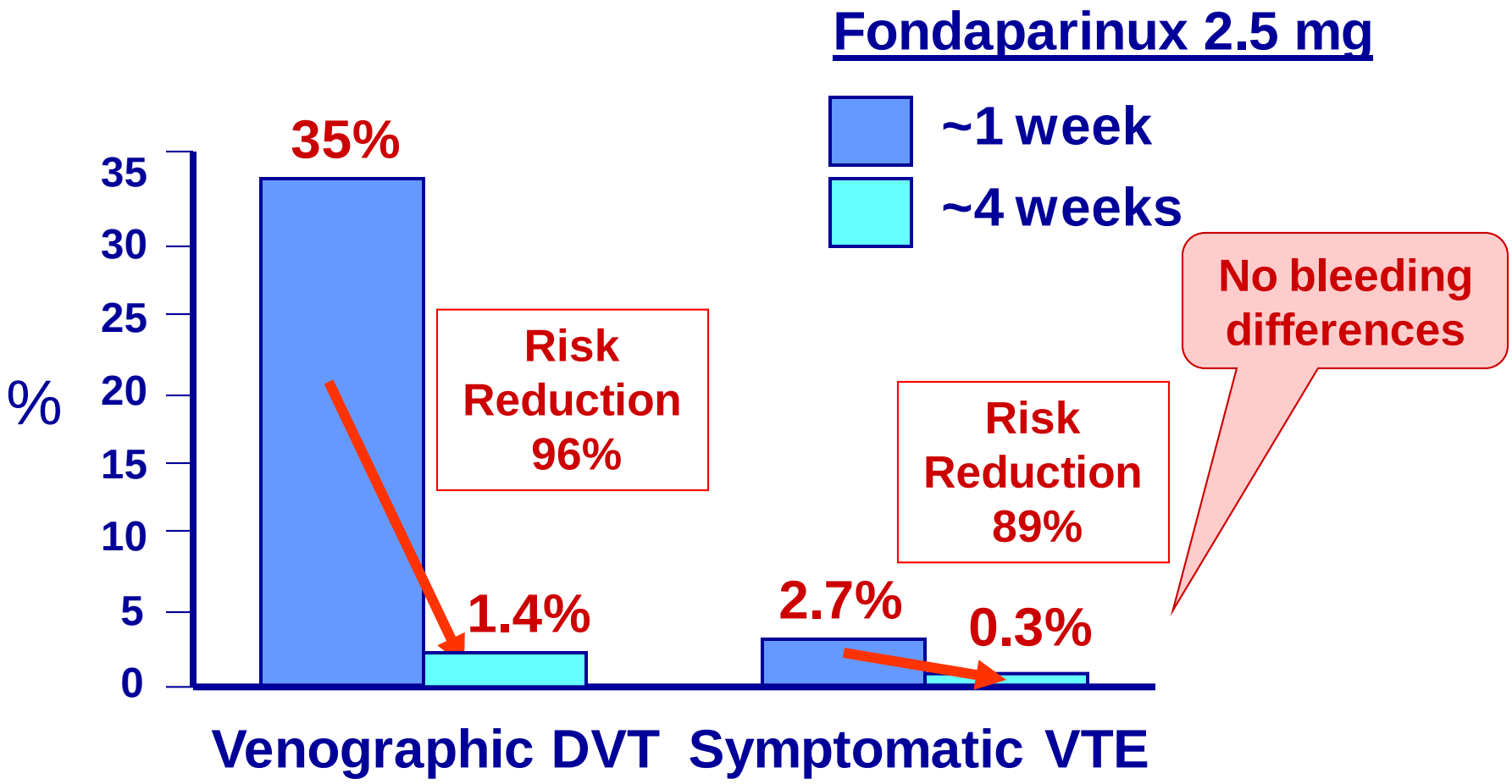
Eikelboom - Lancet 2001;358:9

Extended Prophylaxis Reduces DVT in Hip Fracture Surgery *(n=656)*



Eriksson – Arch Intern Med 2003;163:1337

Extended Prophylaxis Reduces Both DVT and Symptomatic VTE in HFS



Eriksson – Arch Intern Med 2003;163:1337

The Specific Prophylaxis Matters!

- 21,000 discharges + age ≥40 + LOS ≥6 days + received anticoagulant thromboprophylaxis
- Appropriate prophylaxis: ACCP recommended
- Partial prophylaxis: not ACCP recommended or brief

Outcome	Partial prophylaxis (n=15,865)		Appropriate prophylaxis (n=5,136)	*p*
Hospital-acquired **VTE**	1.9%	>	1.4%	*0.04*
Hospital-acquired **PE**	0.9%	>	0.5%	*0.01*
Major **bleeding**	0.4%	>	0.1%	*0.002*
Total costs/patient	$23,823	>	$17,386	*<0.001*

Adherence with prophylaxis guidelines was associated with REDUCED VTE AND REDUCED COSTS.

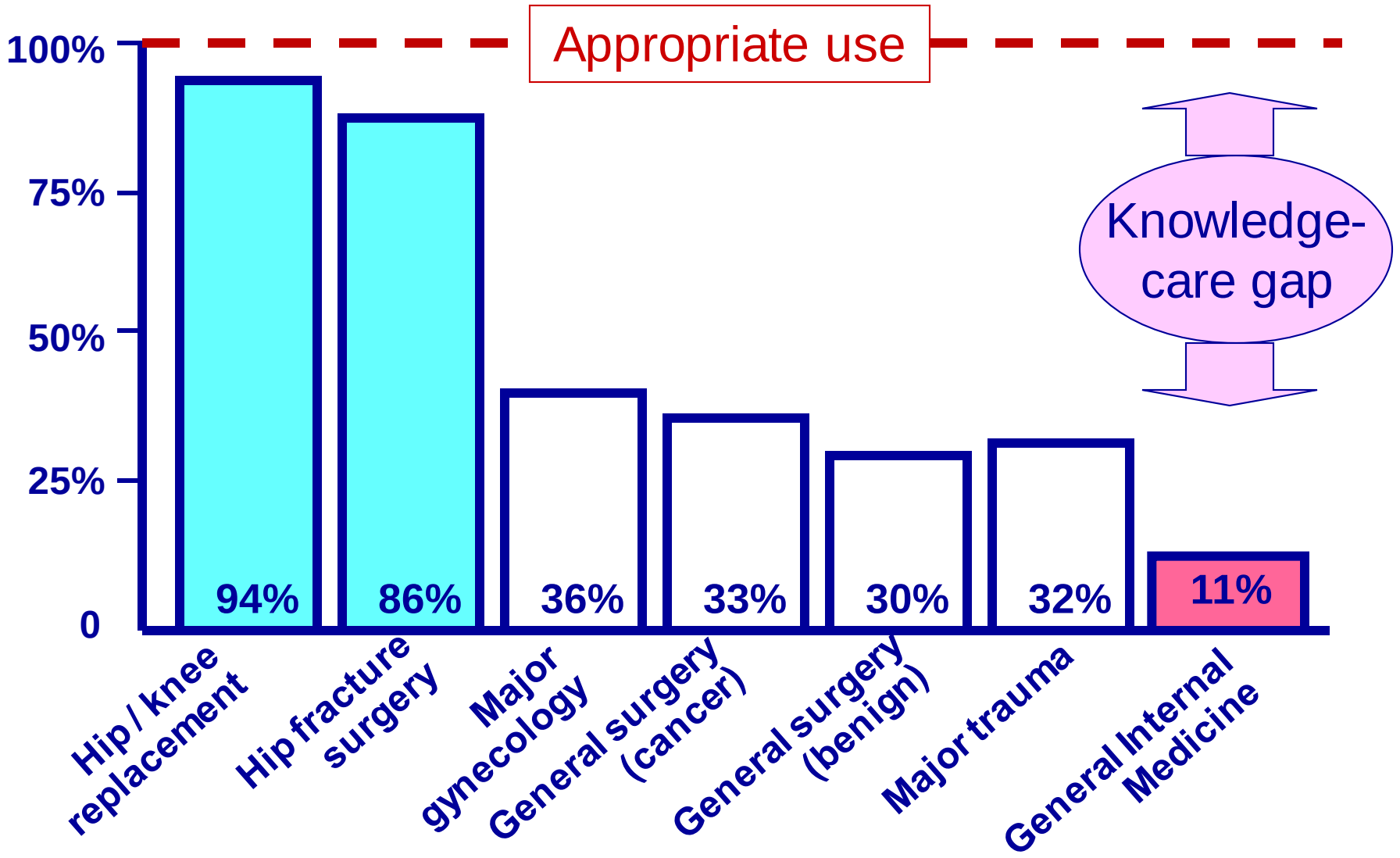
Amin – Thromb Res 2010;125:513

Bleeding with Anticoagulant Prophylaxis

1. In clinical trials, reported bleeding rates are slightly increased, especially
   - minor bleeding
   - with higher doses
   - with early start after surgery
   - if assessor is unblinded (and biased)

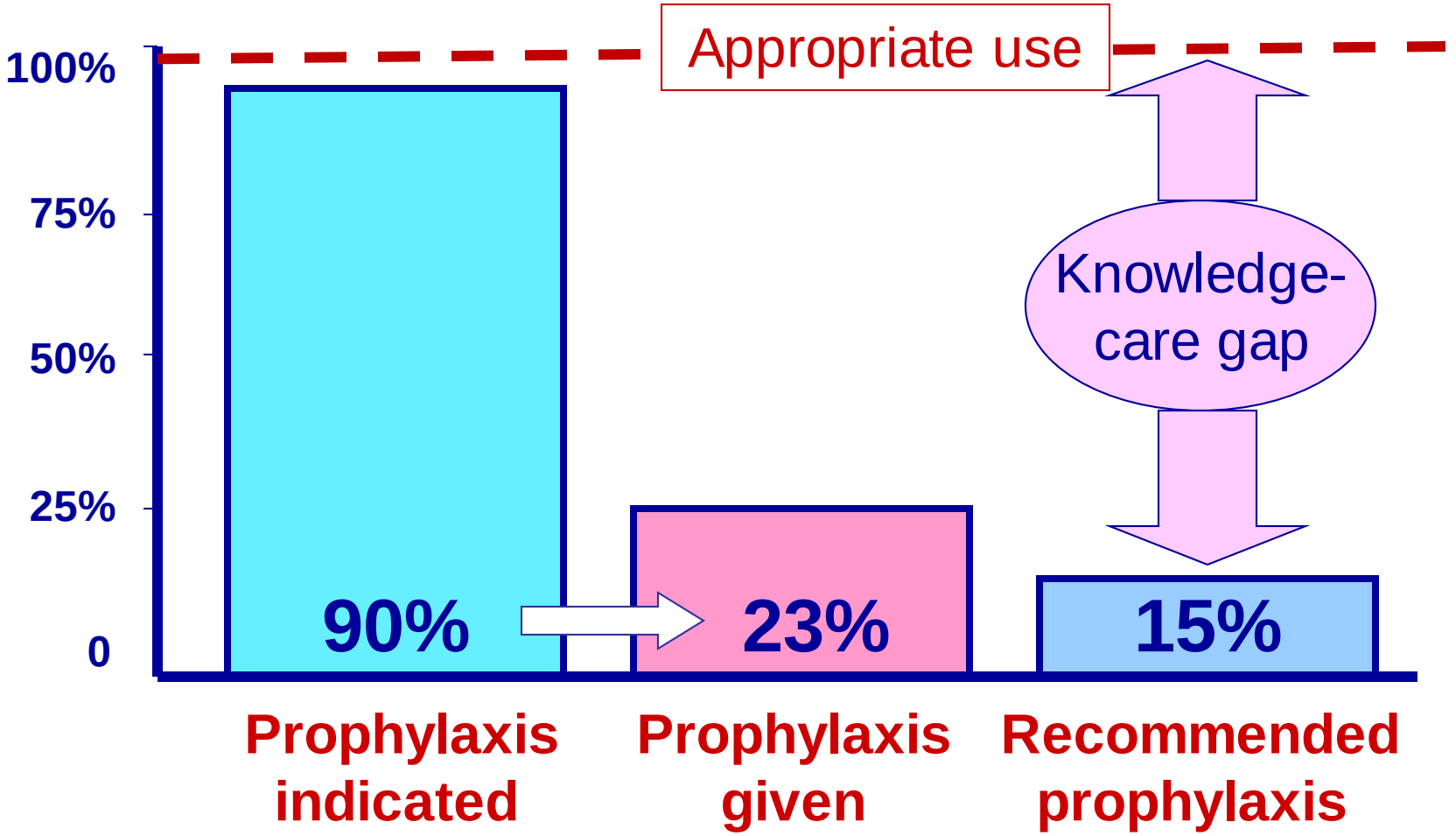
2. In practice, clinically-important bleeding is RARE

2006 Routine Use of Recommended Prophylaxis in 195 *Canadian Hospitals*



Prophylaxis Use in *Medical Patients*

- 1,894 medical patients in 29 hospitals in 6 provinces



Khan – Thromb Res 2007;119:145

Strategies to Improve Thromboprophylaxis Success

I. National

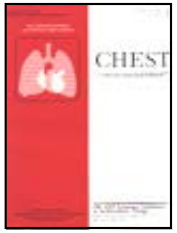
II. Provincial/Local

Dr. Ligertwood

Strategies to Improve Thromboprophylaxis Success

I. National

- Excellent quality guidelines →



- Surgical Safety Checklist
- Accreditation Canada VTE ROP
- Safer Healthcare Now!

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Driving Quality Health Services
Force motrice de la qualité des services de santé

NEW IN 2011

VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS

The team identifies medical and surgical clients at risk of venous thromboembolism (DVT and PE) and provides appropriate thromboprophylaxis.

GUIDELINES

Venous thromboembolism (VTE) is the collective term for deep vein thrombosis (DVT) and pulmonary embolism (PE). VTE is a serious and common complication for clients in hospital or undergoing surgery. Evidence shows that incidence of VTE can be substantially reduced or prevented by identifying clients at risk and providing appropriate, evidence-based thromboprophylaxis interventions during their health care exposures. Currently, the American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th edition) are the generally accepted standard of practice for the prevention of VTE.

The widespread human and financial impact of thromboembolism is well documented. Development of DVT or PE is associated with increased patient mortality, and is the most common preventable cause of hospital death. In addition, both hospital costs and median length of stay are greatly increased for patients developing VTE.

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VTE Prophylaxis ROP

The hospital "identifies medical and surgical clients at risk of venous thromboembolism (DVT and PE) and provides appropriate thromboprophylaxis."

Hospital accreditation requirement started January, 2011

www.accreditation.ca

2010 VTE Prophylaxis ROP

1. The hospital has an organization-wide, **written thromboprophylaxis policy** or guideline.
2. Identifies patients at risk for VTE and provides appropriate, **evidence-based VTE prophylaxis**.
3. Establishes measures for appropriate thromboprophylaxis use, **audits its implementation**, and uses this for quality improvement.
4. Identifies major orthopedic surgery patients who require **post-discharge prophylaxis** and provides it.
5. **Educates** health professionals and patients about VTE and its prevention.

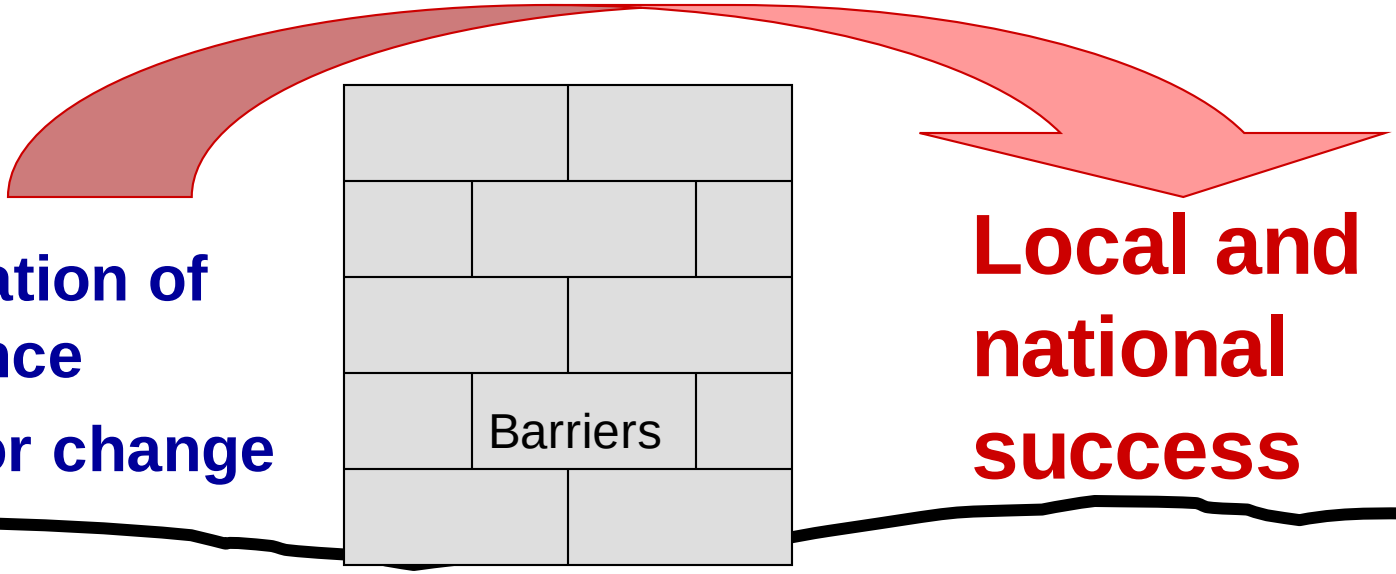
Prevention of VTE

Mission for 2011-12:

The **"go-to" resource for VTE prevention** in Canada oriented to the Accreditation Canada VTE ROP.

Accreditation Canada ROP

- System-wide approach, standardization
- Guidelines, policies, tools
- Order sets



- Appreciation of importance
- Ready for change

Local and national success

- No system-wide approach
- Dependency on (individual) physicians
- Not ready for change (culture)
- No strategy to make change
- No local champion, leader
- No audit data

Clinical Care Management (CCM)

Care of Critically Ill Patients

Hand Hygiene

Heart Failure

Medication Reconciliation

Sepsis

Stroke & TIA

Surgical Checklist

venous thromboembolism - VTE

measurements guidelines meetings/events resources

Our Challenge

Venous thromboembolism (VTE) is a disorder that includes deep vein thrombosis and pulmonary embolism, and is one of the most common preventable complications from hospitalization. Patients who develop deep vein thrombosis can experience pain, swelling, and extreme discomfort. Pulmonary embolism can lead to shortness of breath, chest pain, and death. The majority of hospitalized patients are at risk for developing VTE.

VTE is ***preventable***. Establishing methods to provide appropriate thromboprophylaxis

IMPLEMENTING A QUALITY IMPROVEMENT INITIATIVE

LESSONS FROM THE B.C. HOSPITALIST VTE PREVENTION COLLABORATIVE

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Preliminary Groundwork

- Establish a team
- Define **best practice**
- Measure the difference between **your practice** and ideal practice. (there needs to be a reason to change)
- **Define target** performance:

-develop parameters to be measured (**Metrics**)

-**precisely** define goals

(performance metrics/population target/timeline)

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Lessons From B.C. Hospitalist VTE Prevention Collaborative

THE TEAM

- The **Steering Committee**

- The **Working Group** consisted of 1 Hospitalist representative from each of the 11 sites and the Clinical Lead.

- Researched similar work in Canada and USA and identified experts with successful track records – Dr. Greg Maynard (UCSD) as an informal **mentor**

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Best Practice in VTE Prevention in Hospitalized Patients

BEST PRACTICE

- Defined **Clinical best practice** as that described by ACCP 2008 Chest guidelines
- We spent considerable time researching **implementation strategy,** looking at successful strategies employed in U.S. Hospitalist programs.
- Defining appropriate medical management must be a **marriage between the practical and the ideal**.
- The literature clearly identifies that **simple tools are utilized**, and complex tools often fail

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☐ Low Risk (Must be independently ambulatory outside of room 3 times daily) Observation patients, expected LOS less than 48 hrs: Minor/Ambulatory surgery or Age less than 50 and NO other risk factors, or already on therapeutic anticoagulation	☐ Early ambulation, education
☐ Moderate to High Risk Most medical or surgical patients CHF, pneumonia, active inflammation, advanced age, dehydration, varicose veins, less than fully and independently ambulatory, and other risk factors. All patients not in the Low or Highest Risk Categories ☐ Add Serial Compression Device for Highest Risk Patients Elective hip or knee arthroplasty, Multiple Trauma, Abdominal or Pelvic surgery for cancer, Acute spinal cord injury)	CHOOSE ONE pharmacologic option: ☐ LMH (DALTEPARIN 5000 units OR ENOXAPARIN 40MG SC q24h) until discharge ☐ HEPARIN 5000 units q8h until discharge *OR* If weight less than 40 kg (except patients with active cancer or previous thromboembolic event): ☐ LMWH (DALTEPARIN 2500 units SC OR ENOXAPARIN 30 mg q24h) until discharge ☐ HEPARIN 5000 units subcutaneous q12h until discharge
☐ Contraindication to Pharmacologic Prophylaxis ☐ Active bleeding of clinical significance ☐ High risk of serious bleeding into a critical site (intracranial, intraspinal, pericardial, intraocular, retroperitoneal, intra-articular) ☐ Known major bleeding disorder or a coagulopathy ☐ Platelet count less than 50 X 109/L ☐ History of Heparin Induced Thrombocytopenia ☐ Already on Therapeutic Anticoagulation ☐ Other(specify)_____	☐ Mechanical prophylaxis with sequential compression device. Interrupt for skin care, assessments, toileting and ambulation only *OR* ☐ Contraindicated (peripheral vascular disease or wounds) Reassess daily to start pharmacologic prophylaxis when contraindication resolves

Lessons from B.C. Hospitalist VTE Collaborative

IDENTIFYING A NEED TO CHANGE PRACTICE

- Used extensive data in literature to identify the **gap between present performance and best practice** - most medical hospitals provide 30 to 45% of their patients with appropriate VTE prophylaxis unless formal process in place

- Pilot study at VGH **confirmed** performance data in literature

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Lessons from B.C. Hospitalist VTE Collaborative

DEFINE TARGET

- Defined a target of **"greater than 90% compliance with appropriate VTE prophylaxis in Medical patients under the care of a Hospitalist in 11 hospitals across B.C. in 1 year"**
- Appropriate VTE prophylaxis defined as adherence with our risk stratification tool.

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ENGAGE STAKEHOLDERS

- **Must identify a need to change!**

  -Reasons for change may vary with the different stakeholders; save lives, reduce LOS, adhere with accreditation standards

  -need to make this specific to the stakeholder groups

  -this requires an education component

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Lessons From The B.C. Hospitalist VTE Prevention Collaborative

- Had a **provincial conference day** on Quality improvement in Hospital Care for Hospitalists and made VTE Prophylaxis the focus (50% of the full time hospitalists)
- Had well **respected speakers** such as;

  -Dr. Kaveh Shojania (Canada research chair in Patient Safety and QI)

  -Dr. Doug Cochrane (Chair of BC Patient Safety and Quality Council)

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Lessons from B.C. Hospitalist VTE Collaborative

- We educated around **VTE best practice** in medical patients
- We extrapolated national and international data to the Hospitalist patient population in B.C.. This **identified the impact on mortality, morbidity and cost to the B.C. Hospitalist patient population**
- Hospitalists at 11 different hospitals volunteered to be **site leaders for implementation**.

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Define Process Change

- **Process map**
- Identify **points** in the process where intervention is necessary
- Develop method of embedding your intervention into **normal processes**

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Lessons From The B.C. Hospitalist VTE Prevention Collaborative

- For Medical patients, the **Admission** is the easiest and most reliable **point of intervention**
- Developed Admission **Pre-printed order sets** at each site and ask them to embed the risk stratification tool in them

CRITICAL POINT:

The Admission PPO must integrate with the present practice plan of Hospitalists at each site. It must also be perceived as making work easier!

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Audit to Confirm Success

- CCM guidelines require **prospective auditing**
- **Outcome measures** of reduced VTE and associated mortality and morbidity is ideal, but can be difficult in some patient populations
- **Process measures** of "appropriate VTE prophylaxis" are essential
- **Process measures** of "use of intervention tool" can be used for large scale screening, but is not adequate to define success (some use for PDSA)

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Lessons From The B.C. Hospitalist VTE Prevention Collaborative

GOAL: 90% APPROPRIATE VTE PROPHYLAXIS

- Each site was asked to do 30 chart audits performed by a Hospitalist per month.
- Common audit tool was used
- 3 months of baseline data
- All data was sent to the Steering Committee where the data was collated, graphed and returned to the sites for feedback
- Monthly teleconferences were used to mentor the site leaders and undertake PDSA reviews

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☐ Moderate to High Risk Most medical or surgical patients CHF, pneumonia, active inflammation, advanced age, dehydration, varicose veins, less than fully and independently ambulatory, and other risk factors. All patients not in the Low or Highest Risk Categories ☐ Add Serial Compression Device for Highest Risk Patients Elective hip or knee arthroplasty, Multiple Trauma, Abdominal or Pelvic surgery for cancer, Acute spinal cord injury)	CHOOSE ONE pharmacologic option: ☐ LMH (DALTEPARIN 5000 units OR ENOXAPARIN 40MG SC q24h) until discharge ☐ HEPARIN 5000 units q8h until discharge ∗OR∗ If weight less than 40 kg (except patients with active cancer or previous thromboembolic event): ☐ LMWH (DALTEPARIN 2500 units SC OR ENOXAPARIN 30 mg q24h) until discharge ☐ HEPARIN 5000 units subcutaneous q12h until discharge
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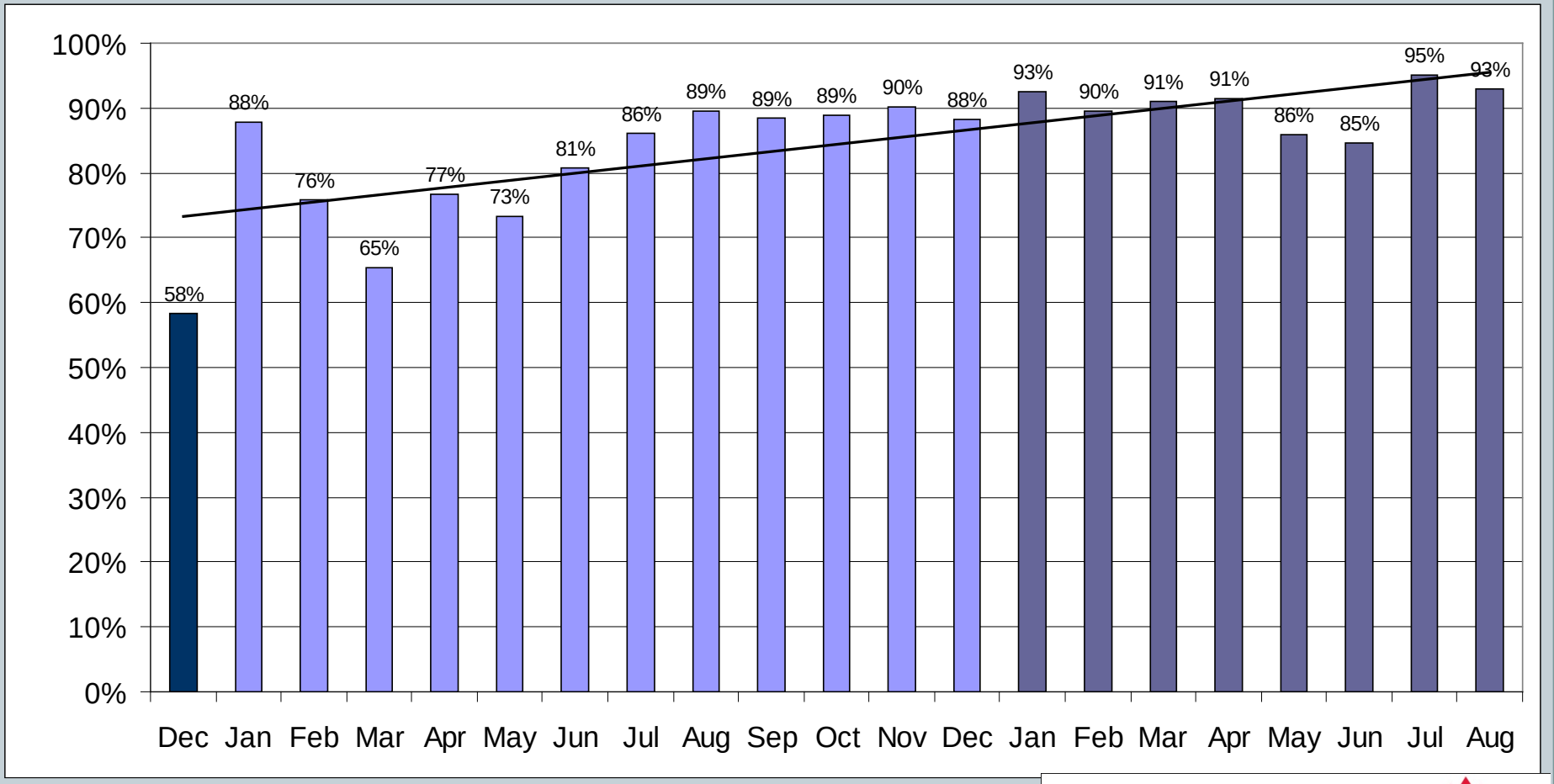
Pre-printed Admission Order Set Used	↑Y	↑N
Pharmacologic Prophylaxis Currently Ordered	↑Y	↑N
Mechanical Prophylaxis Ordered	↑Y	↑N
Mechanical Prophylaxis in Use at Time of Audit	Y	↑N
Current Prophylaxis is Appropriate (as per risk assessment tool)	**↑ Y**	**↑N**

Key Metrics

Key Metric	Value
Analysis Period	December 2009 to August 2011
Hospitals incorporated in Analysis	11
Hospitals Excluded from Analysis *	2
Audit's Submitted	**4,992**
Audits Excluded **	149
Audits Analysed (N=)	4,843
Average Audits Per Month	231
Average Audits Per Hospital Per Month	21

Notes:
* Hospitals excluded are those which have not submitted any audit results in the analysis period
** Excluded Audits are those with no value entered for Prophylaxis Appropriate field.

Combined Results & Linear Trend



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Feedback Performance!

What we think or what we believe is, in the end, of little consequence. The only thing of consequence is what we do.

John Ruskin

You must audit to prove that you have actually done something.

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VTE Virtual Learning Series:

Dec 1, 10-11am:	**Preventing VTE: Evidence and Execution**
Jan 17, 2-3pm:	**Preventing VTE: Implementation and Auditing Strategies**
2012:	**ROPs for VTE: Educating Nurses and Caregivers**
2012:	**ROPs for VTE: Engaging and Educating Patients**
2012:	**ROPs for VTE: Outpatient Followup for Orthopedic Surgery**

Quality Improvement Resources:

http://www.impactbc.ca/

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www.clinicalcaremanagement.ca