ANTICOAGULATION BOOTCAMP
THROMBOSIS CANADA
ANNUAL CONFERENCE

Saturday
November 1
2014

McMaster University
HEALTH SCIENCES

Keynote Speaker

Dr. William Geerts, MD, FRCPC
Professor, Department of Medicine, University of Toronto,
Director, Thromboembolism Program,
Sunnybrook Health Sciences Centre, Toronto, ON

McMaster University HEALTH SCIENCES
St. Joseph's Healthcare Hamilton
Hamilton Health Sciences
Thrombosis Canada
Thrombose Canada
Anticoagulation FORUM

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Faculty/Presenter Disclosure

- **Faculty:** Dr. William Geerts
- **Relationships with commercial interests:***
  - **Grants/Research Support**: NA
  - **Speakers Bureau/Honoraria:** Bayer, Leo Pharma, Sanofi
  - **Advisory Boards:** Bristol-Myers Squibb, Leo Pharma
  - **Other:** Bayer, GSK, Sanofi

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Disclosure of Commercial Support

- **This program has received financial support from** Alexion Canada, Leo Pharma, Amgen, AstraZeneca, Bayer, Boehringer Ingelheim, Covidien, Novartis, Octapharma, BMS/Pfizer Alliance, Pfizer Canada Injectables, Aspen Pharmacare and Sanofi in the form of an Unrestricted Educational Grant
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  - Dr. William Geerts has received payment from Bayer, Leo Pharma, Sanofi.
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Mitigating Potential Bias

- No commercial or other non-commercial organization have had any input to the content of this program

- No commercial or other non-commercial organization have been present at or privy to any discussions, meetings, or other activities related to the content of this program

Reducing Hospital-Acquired VTE: A "Nomadic" Quality Improvement Journey

Bill Geerts, MD, FRCPC

Director Thromboembolism Program, Sunnybrook HSC

Professor of Medicine, University of Toronto

Executive, Thrombosis Canada

National Lead, VTE Prevention, Safer Healthcare Now!

Sunnybrook HEALTH SCIENCES CENTRE

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Thrombosis Canada / Thrombose Canada

safer healthcare now!

Outline

- Brief, selective and personal discussion of the road to improved patient safety through the optimal use of thromboprophylaxis

Hospital-Acquired VTE

Is it a problem? → Can it be fixed? → Can it be fixed consistently?

Hospital-Acquired VTE

Is it a problem? → Can it be fixed? → Can it be fixed consistently?

Clinical research

Practice guidelines

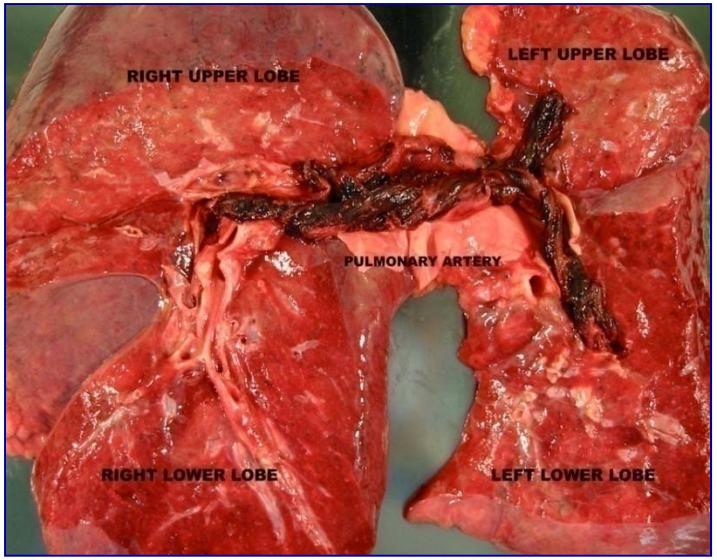
QI – local, national

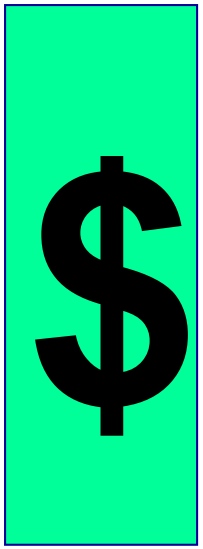
QI research

Why are we concerned about thromboprophylaxis?

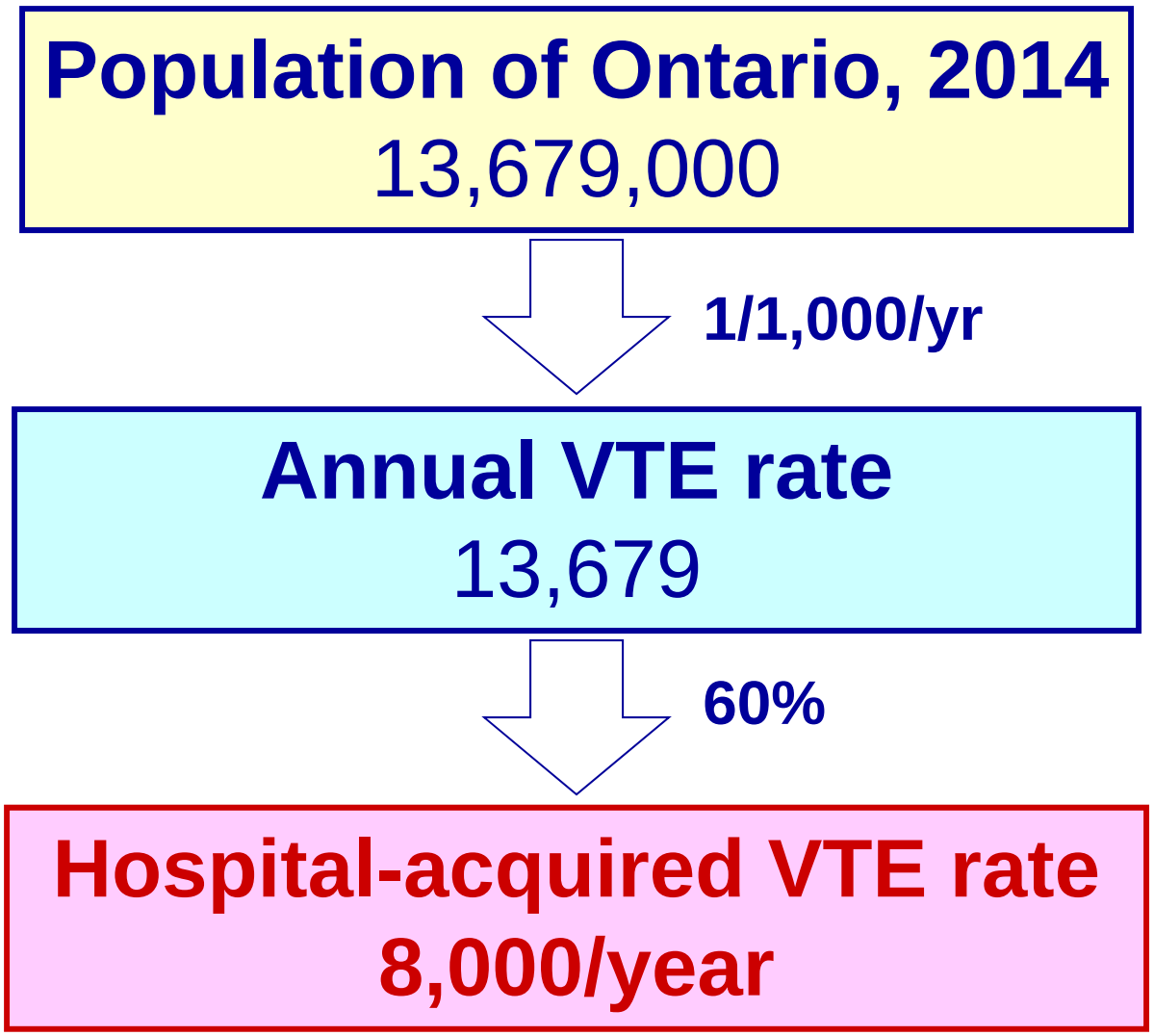
1. Because 60% of all venous thromboembolism (VTE) in the population is hospital-acquired
2. Because VTE causes substantial harm
3. Because HA-VTE can be prevented (effectively, safely, inexpensively)

Consequences of *Unprevented VTE*





Burden of Hospital-Acquired VTE



Evidence for Thromboprophylaxis

1. More than 450 randomized trials show that VTE can be safely prevented
2. Guidelines have recommended routine thromboprophylaxis for 28 years
3. Thromboprophylaxis is standard of care for almost all hospital patients in 2014

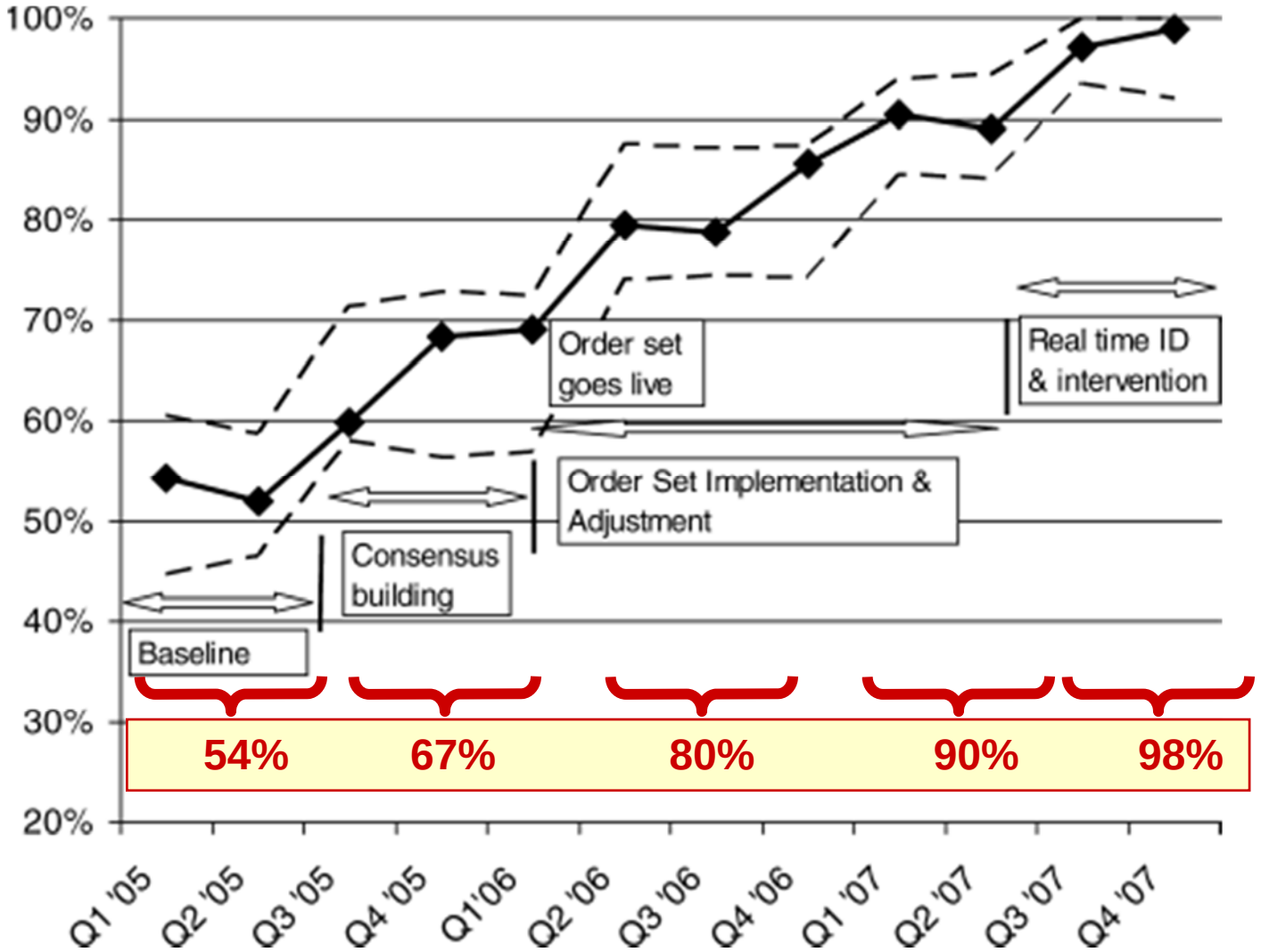
What is the evidence?

- Consistent 60-70% reduction in asymptomatic VTE without a significant increase in major bleeding

But, does prophylaxis improve clinically-important outcomes?

4 recent examples

1 QI improves Thromboprophylaxis



Maynard – J Hosp Med 2010;5:10

QI efforts also reduce VTE

- Risk assessment tool linked to recommended prophylaxis options
- Active monitoring, feedback and interventions to improve adherence

	2005	2007	*P*
Patients at risk	9,720	11,207	
Appropriate prophylaxis	**58%**	**98%**	***<0.001***
Hospital-acquired VTE	**131**	**92**	***<0.001***
Preventable hospital-acquired VTE	**44**	**7**	***<0.001***

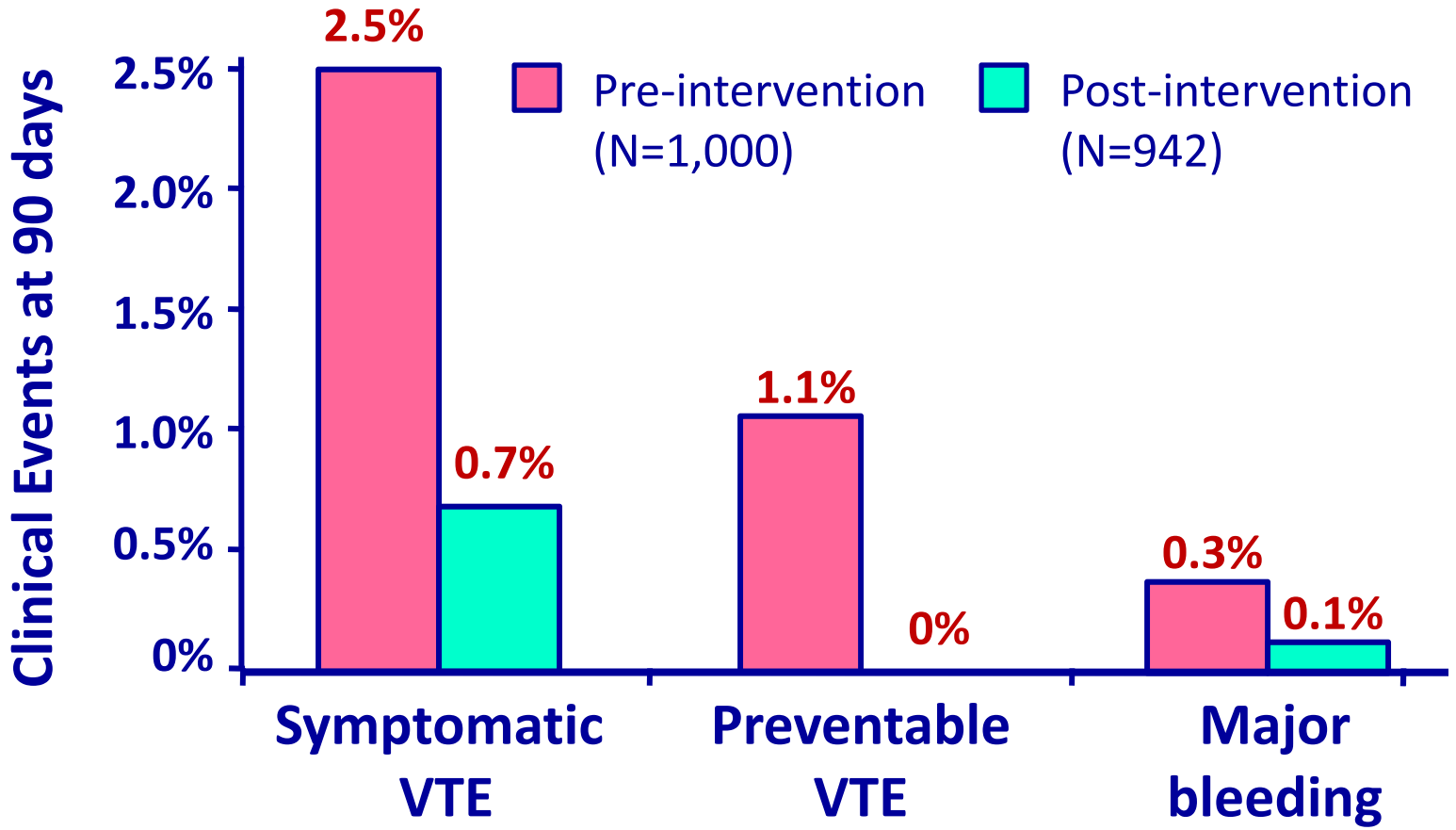
1

2

Maynard – J Hosp Med 2010;5:10

2 Increased Thromboprophylaxis leads to Fewer Adverse Outcomes

- Medical patients at Johns Hopkins



Zeidan – Am J Hematol 2013;88:545

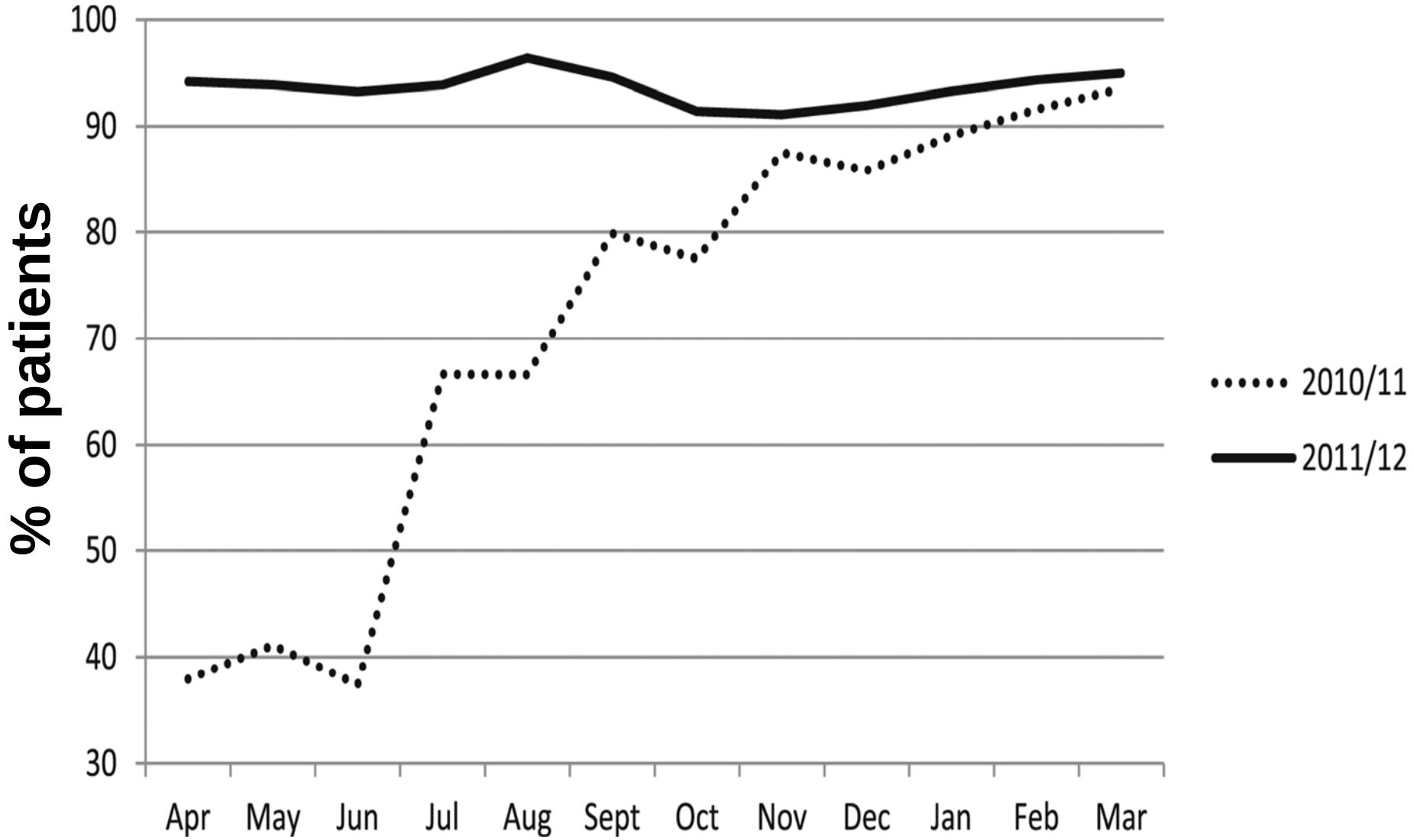
3

Effect of a VTE Prevention Program on HA-VTE

- QI project at King's College Hospital, London launched in 2010
- Developed a local VTE Prevention Program
- Mandatory, documented VTE risk assessment
- VTE prophylaxis guidance
- Mandatory VTE education for staff
- Identification of hospital-associated VTE
- Root cause analysis with subsequent targeted QI interventions

Roberts – Chest 2013;144:1276

Patients with a VTE Risk Assessment



Roberts – Chest 2013;144:1276

VTE Prevention Program Reduces HA-VTE

- QI project at King's College Hospital, London, 2010-12

	2010-11	2011-12	*p*
VTE risk assessment	**63%** (38-88)	**93%** (90-97)	
HA-VTE	**236**	**189**	***0.014***
	19.7/mo	**15.8/mo**	
Per 1,000 admissions	**1.5**	**1.0**	
Potentially preventable HA-VTE	**43%**	**32%**	***0.005***

Roberts – Chest 2013;144:1276

4 Hospital-Acquired VTE in the UK

4,141,000 admissions >3 days in all 163 NHS hospital trusts, 2010-12

- **Readmissions with VTE 8,578**
- **In-hospital fatal VTE 4,334**
- **Fatal VTE disch-90 days 1,651**
- **In-hosp/post-disch fatal VTE 5,985**

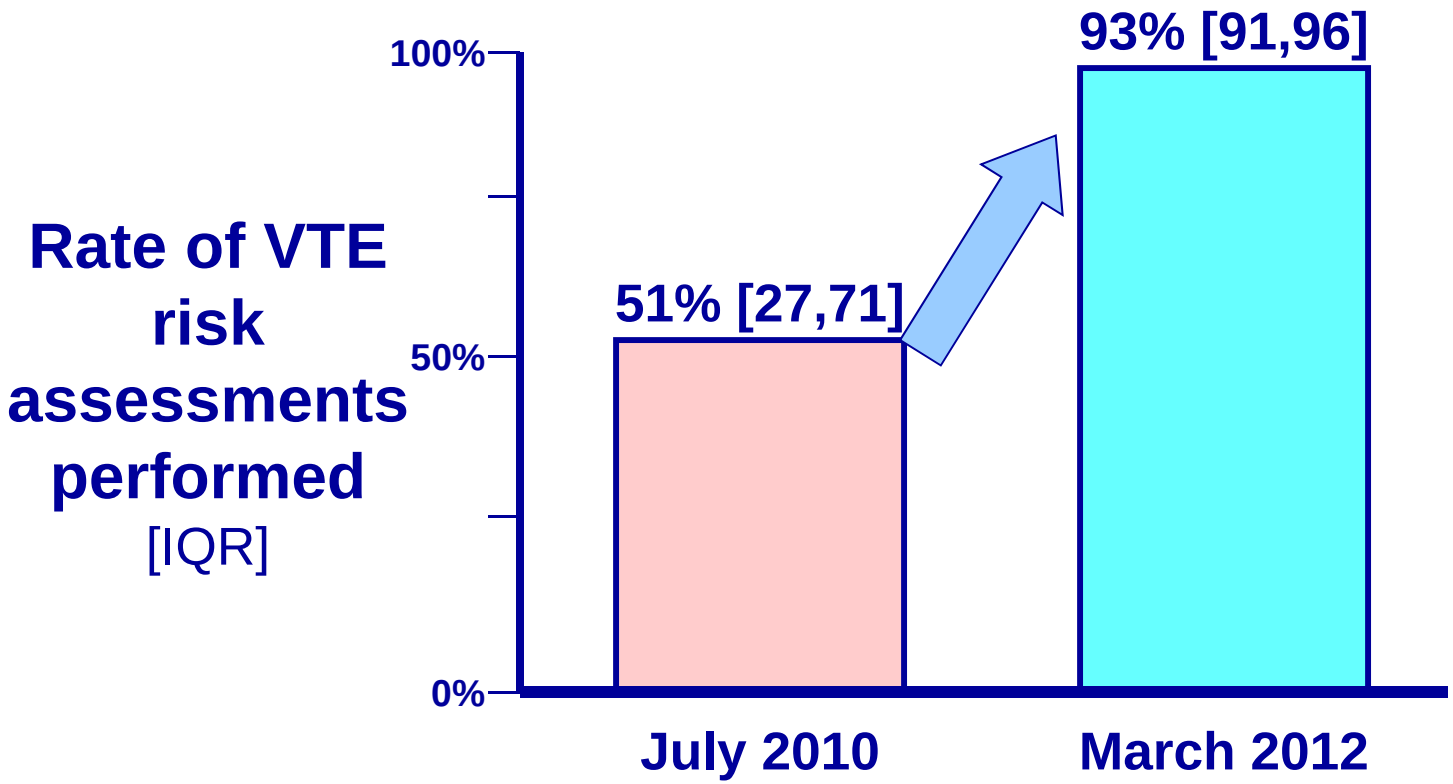
1. 1/500 admissions are readmitted with VTE

2. 1/700 admissions die of VTE <90 days

Lester – Heart – 2013;99:1734

Use of the UK National VTE Risk Assessment Tool

- All patients admitted to all 163 NHS trusts, 2010-12
- Mandatory reporting of use of the VTE risk tool



Lester – Heart – 2013;99:1734

Hospital-Acquired Fatal VTE is Reduced in Adherent Hospitals

- All 4 million patients admitted to all 163 NHS hospital trusts >3 days, 2010-12

Fatal VTE ≤90 days after hospital discharge	Rel Risk for hospitals with VTE risk assessment >90% vs <90%
All	0.85 [0.75-0.96; *p=0.01*]
Post-discharge	0.81 [0.67-0.79; *p=0.03*]

Achieving >90% VTE risk assessment is associated with significant lower VTE mortality

Lester – Heart – 2013;99:1734

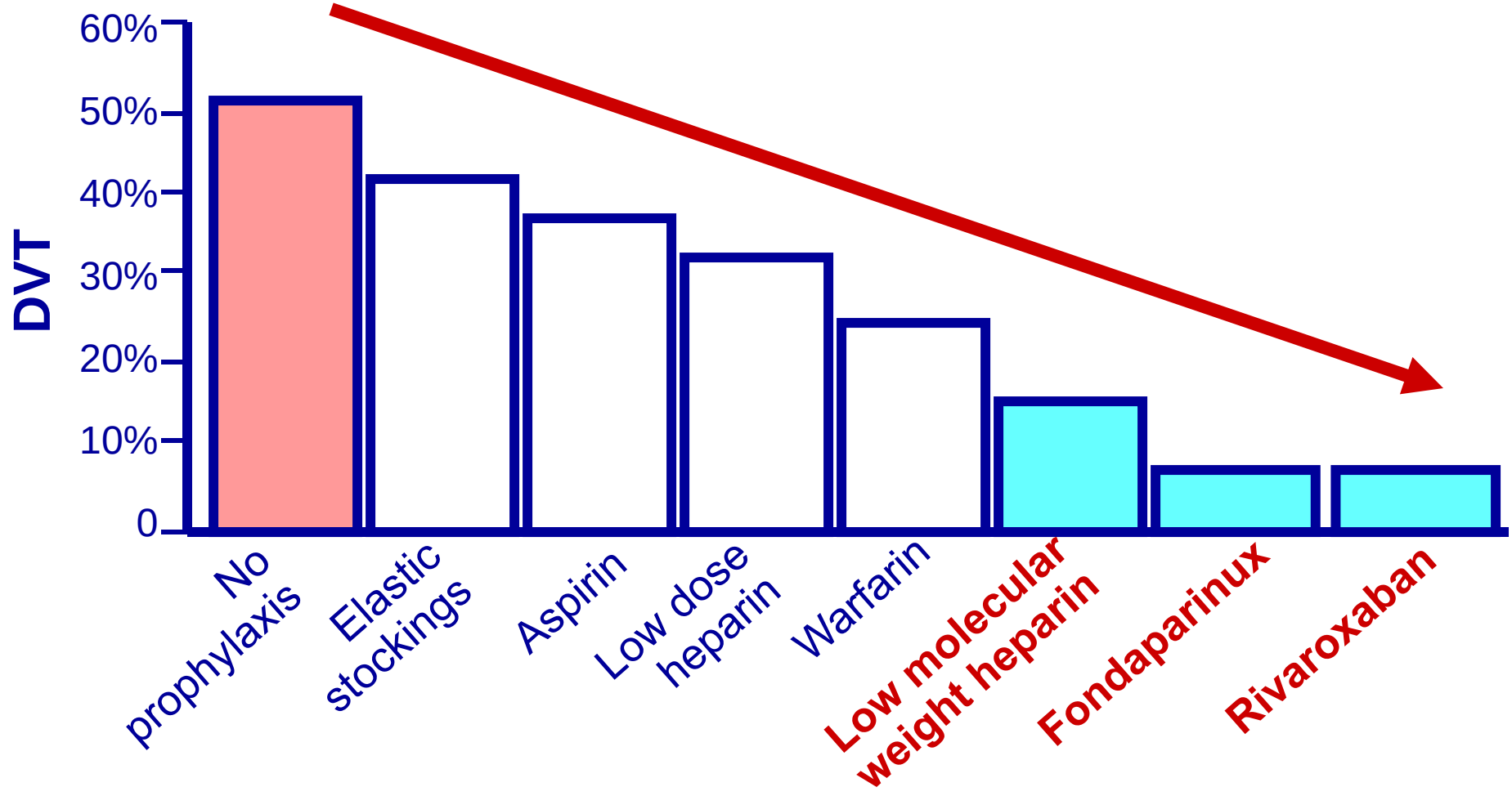
National VTE Mortality Data

England

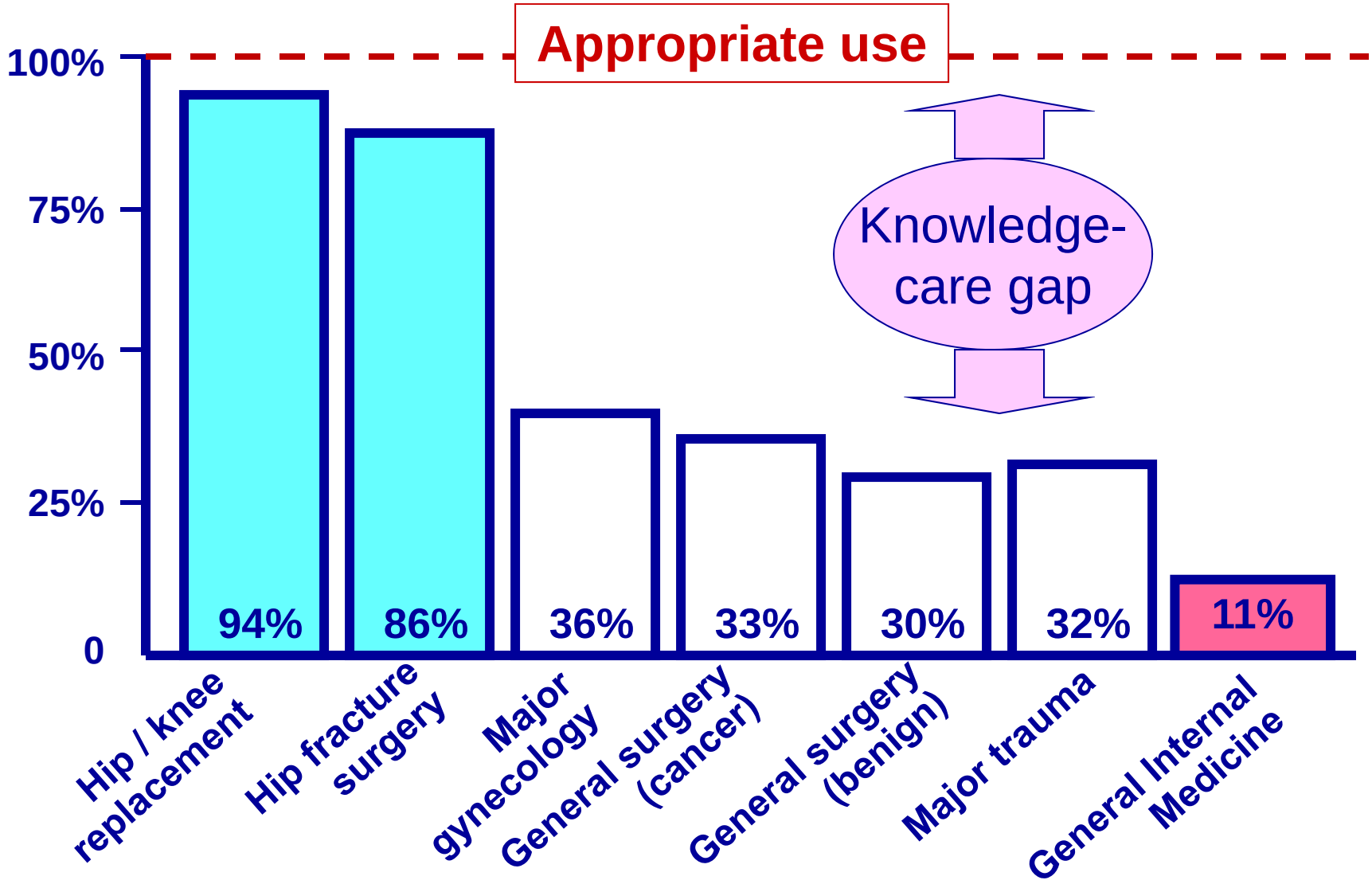
Year	VTE listed as cause of death
2007	6,121
2008	6,170
2009	6,218
2010	6,282
2011	4,562
2012	4,668

From R. Arya - Office for National Statistics, 2013

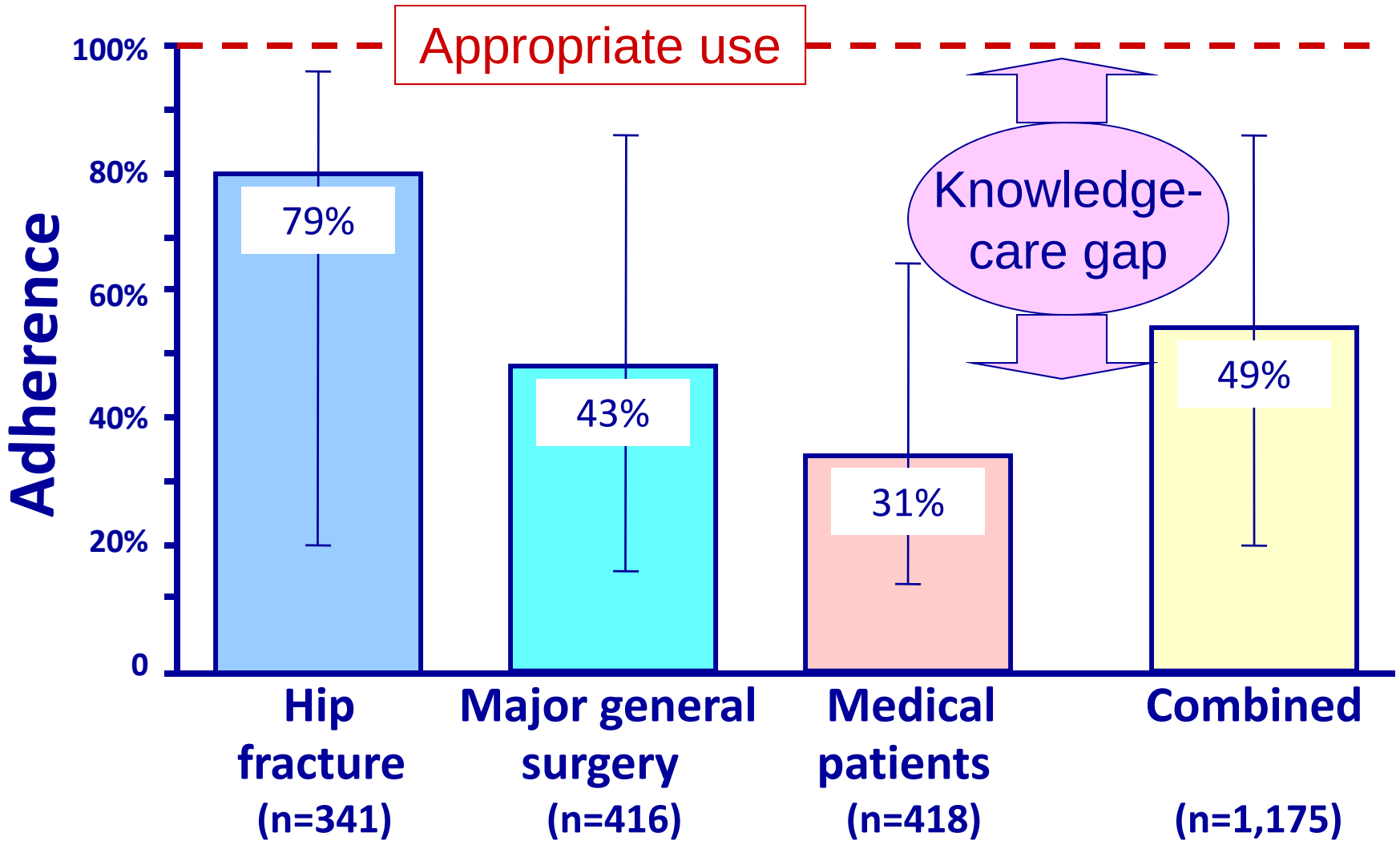
Better Prophylaxis Options Reduce the Risk of DVT after TJR



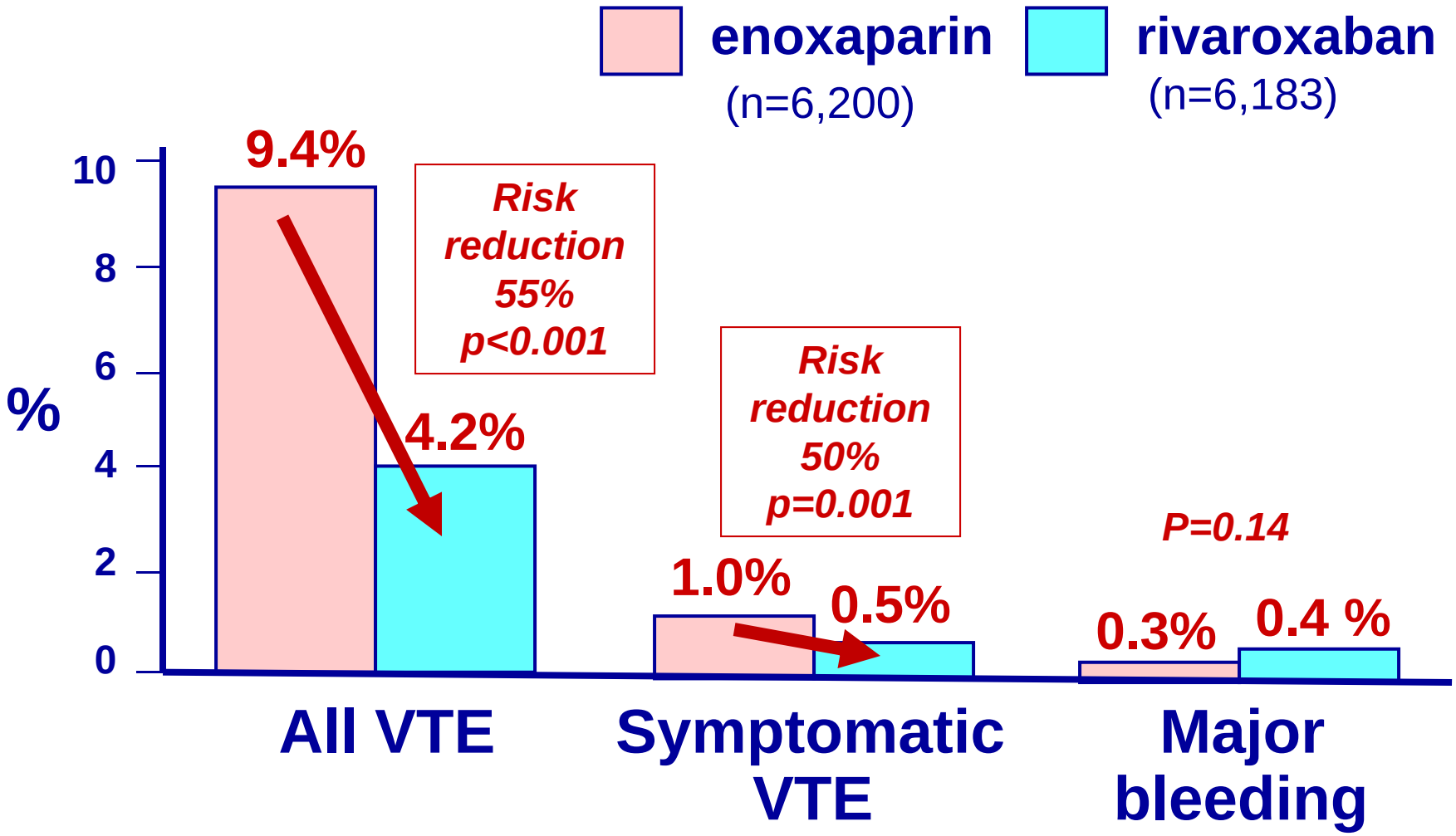
2006 Routine Use of Recommended Prophylaxis in 195 Canadian Hospitals



Prophylaxis use in 8 Toronto hospitals



Oral Rivaroxaban after *THR/TKR*



Turpie – Thromb Haemost 2011;105:444

Advantages of rivaroxaban Thromboprophylaxis in TJR

- **More effective and as safe as LMWH**
- **Oral, once daily**
- **No lab monitoring**
- **Cheaper than LMWH** (~$3/day in Canada; in Ontario, covered by ODB for TJR)
- **Post-discharge prophylaxis is simple and inexpensive → high compliance**

Prophylaxis in ***Hip and Knee Arthroplasty*** → ***start postop***

Admit

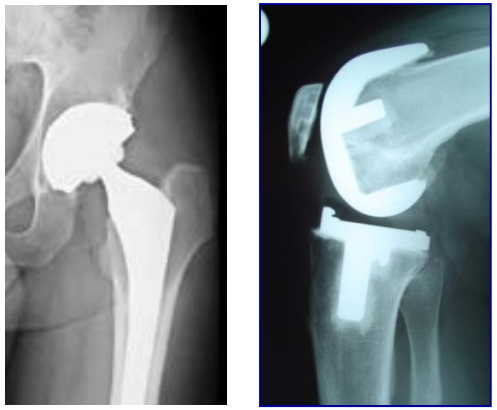
↓

OR

↓

Discharge or rehab

↓



- **rivaroxaban 10 mg PO once daily**
- low molecular weight heparin SC

0 1 2 3 4 5 6 7 8 9 10 14 21 28

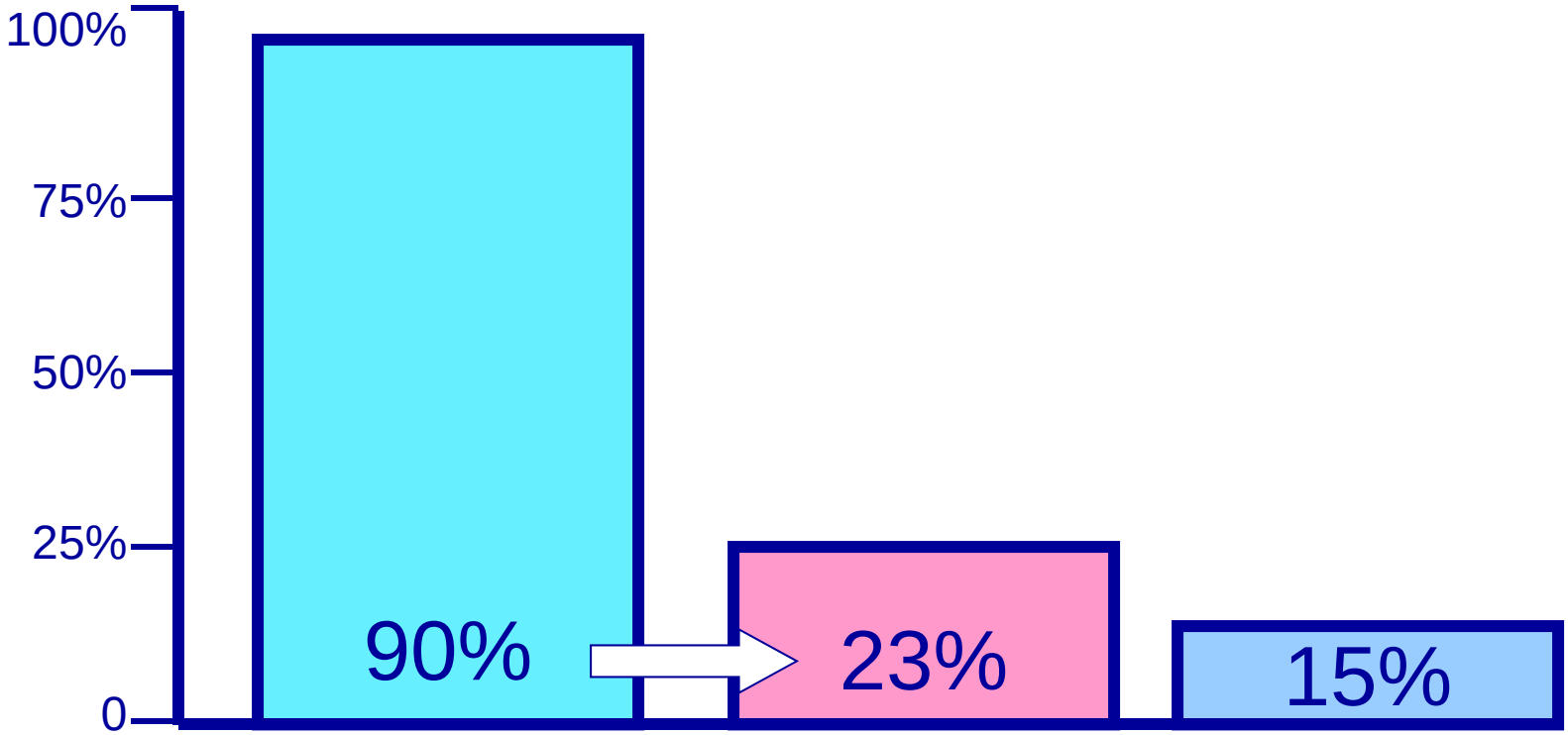
days

2014 Thromboprophylaxis Summary

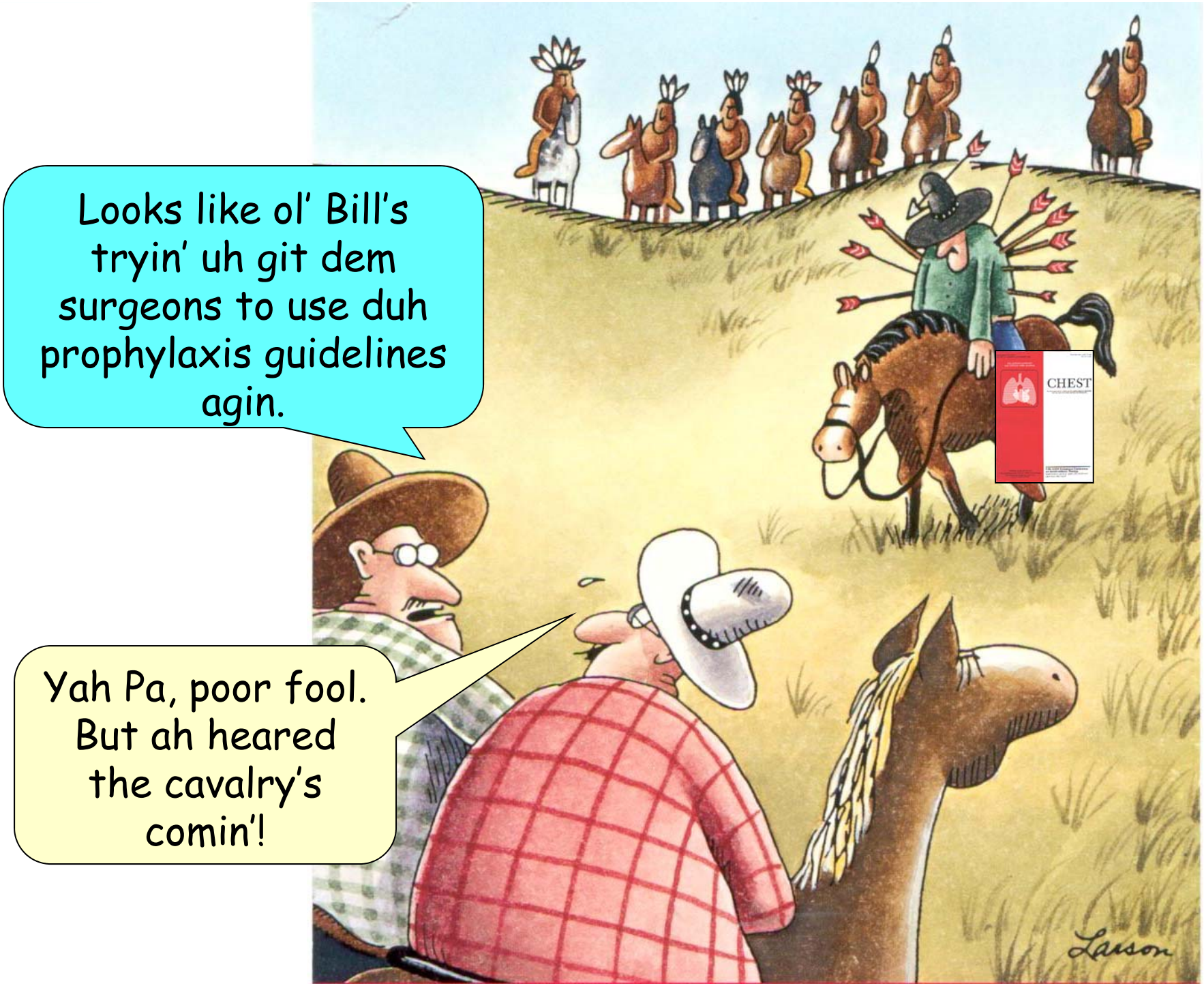
Patient Group	Options	Duration
Acute medical illness	❖ **LMWH**	Discharge
Surgery: general, gyne, thorac, urol	❖ **LMWH**	Discharge (up to 4 wks for selected cancer patients)
Major orthopedics - THR, TKR	❖ **rivaroxaban** ❖ LMWH	2-6 weeks
- Hip fracture surg	❖ **LMWH**	2-6 weeks
High bleeding risk	❖ mechanical	Until LMWH can start

Prophylaxis Use in Medical Patients

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



Khan – Thromb Res 2007;119:145


Looks like ol' Bill's tryin' uh git dem surgeons to use duh prophylaxis guidelines agin.
Yah Pa, poor fool. But ah heared the cavalry's comin'!
CHEST
Larson

ACCREDITATION CANADA

VTE Prophylaxis Required Organizational Practice (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

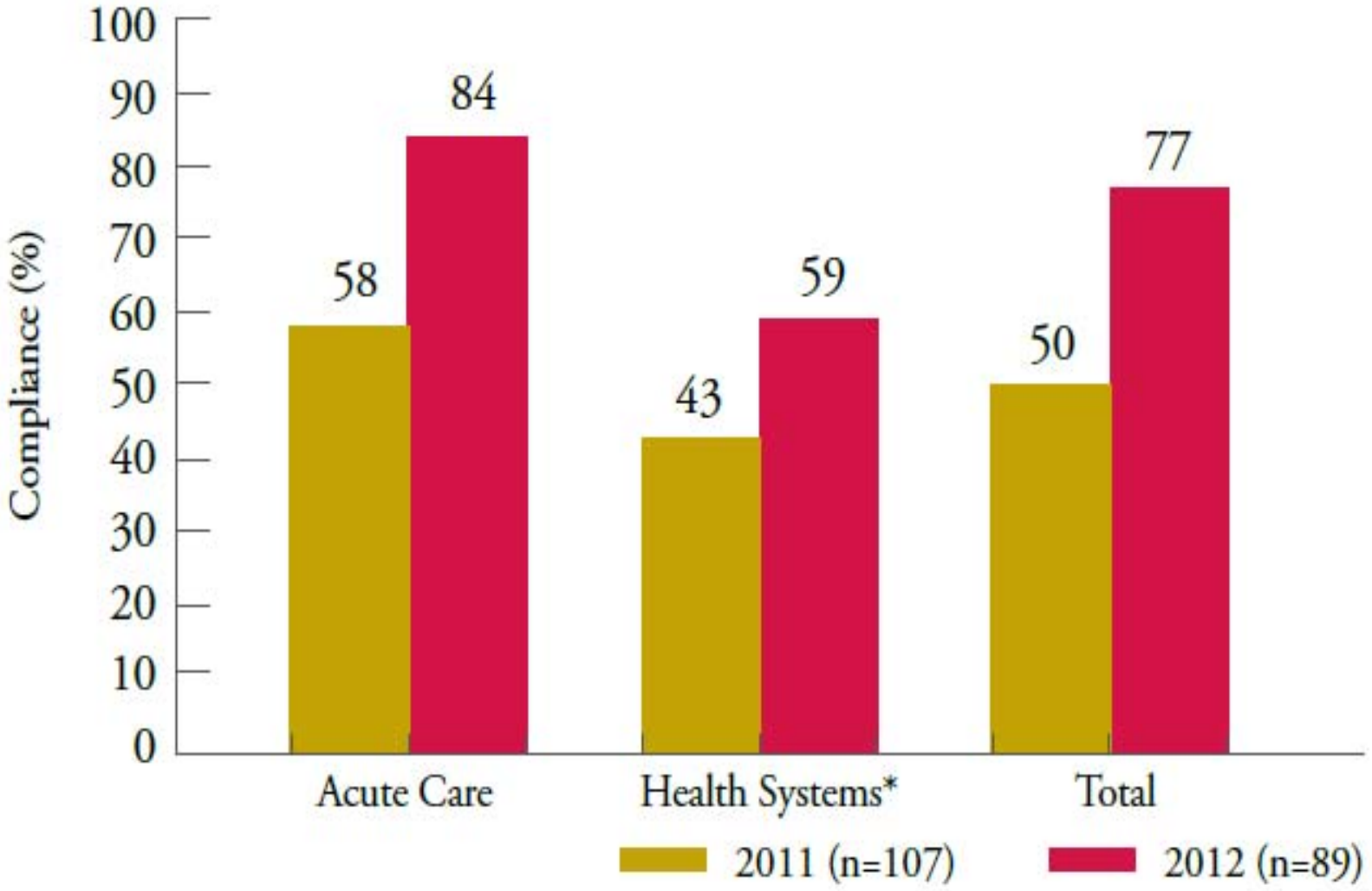
ACCREDITATION CANADA

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.

www.accreditation.ca

Accreditation Canada VTE Prophylaxis ROP compliance rates, by sector, 2012



* Health systems include health authorities and Quebec's Centres de santé et de services sociaux (CSSS) [Health and Social Services Centres].

2013 National VTE Audit

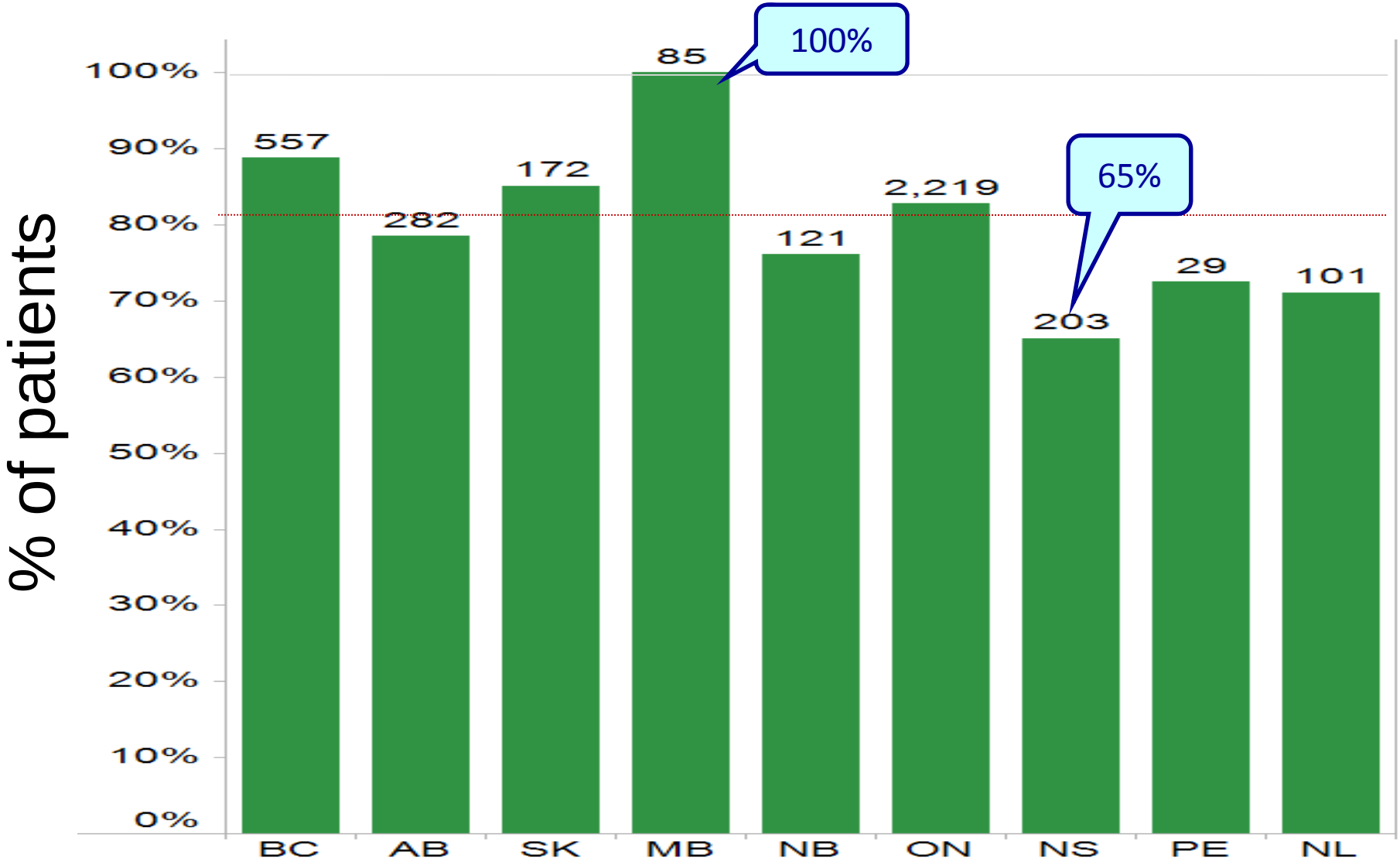
- April 10 to 18, 2013
- 118 centers, 4,667 patients, 9 provinces coast to coast
- General medical and general surgical patients at risk for VTE
- Analyses conducted by Central Measurement Team on data from Patient Safety Metrics (PS Metrics)

2013 National VTE Audit

- **Overall, appropriate thromboprophylaxis use = 81%**

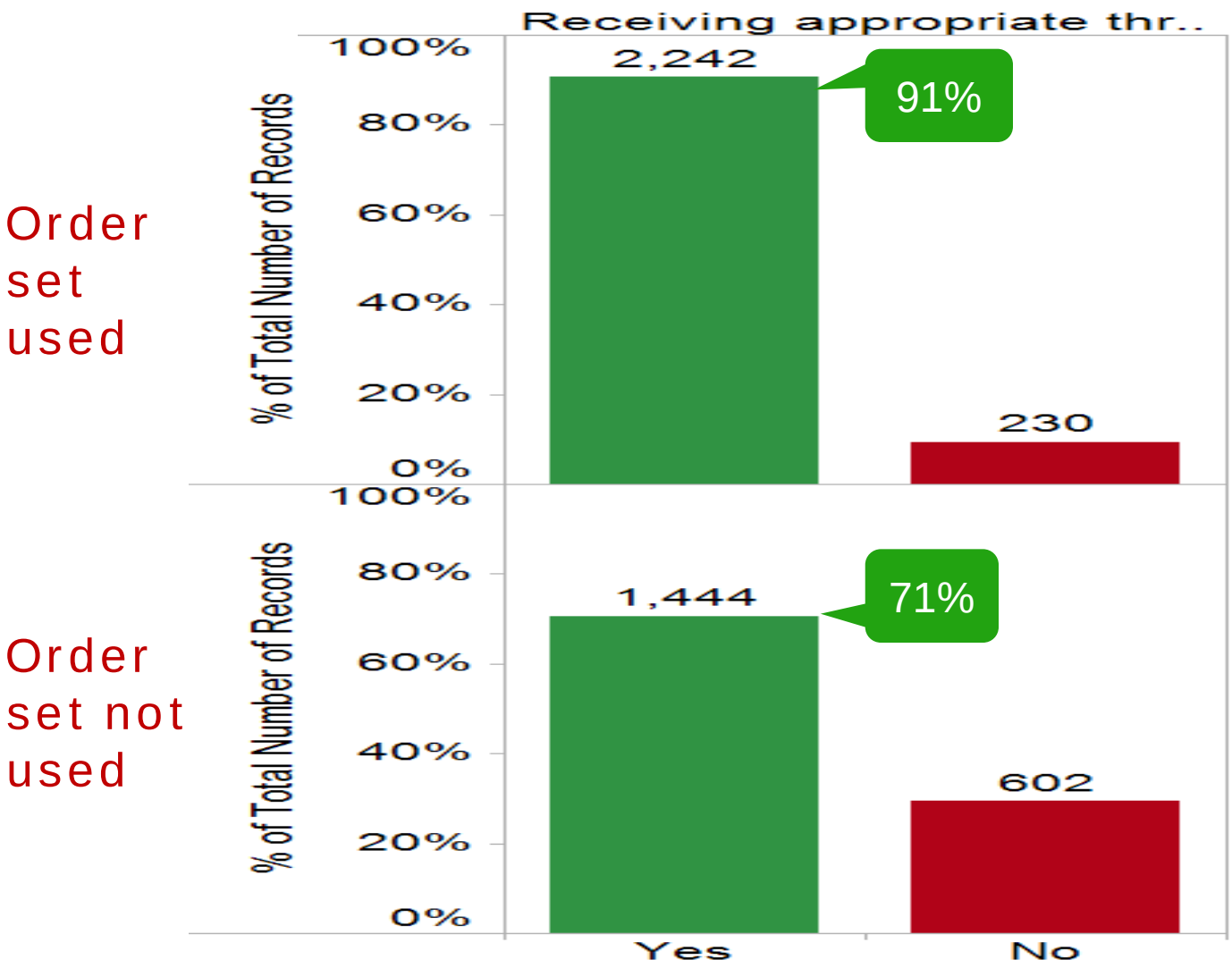
- Very good (but with room for improvement)

Appropriate Thromboprophylaxis by Province (2013)

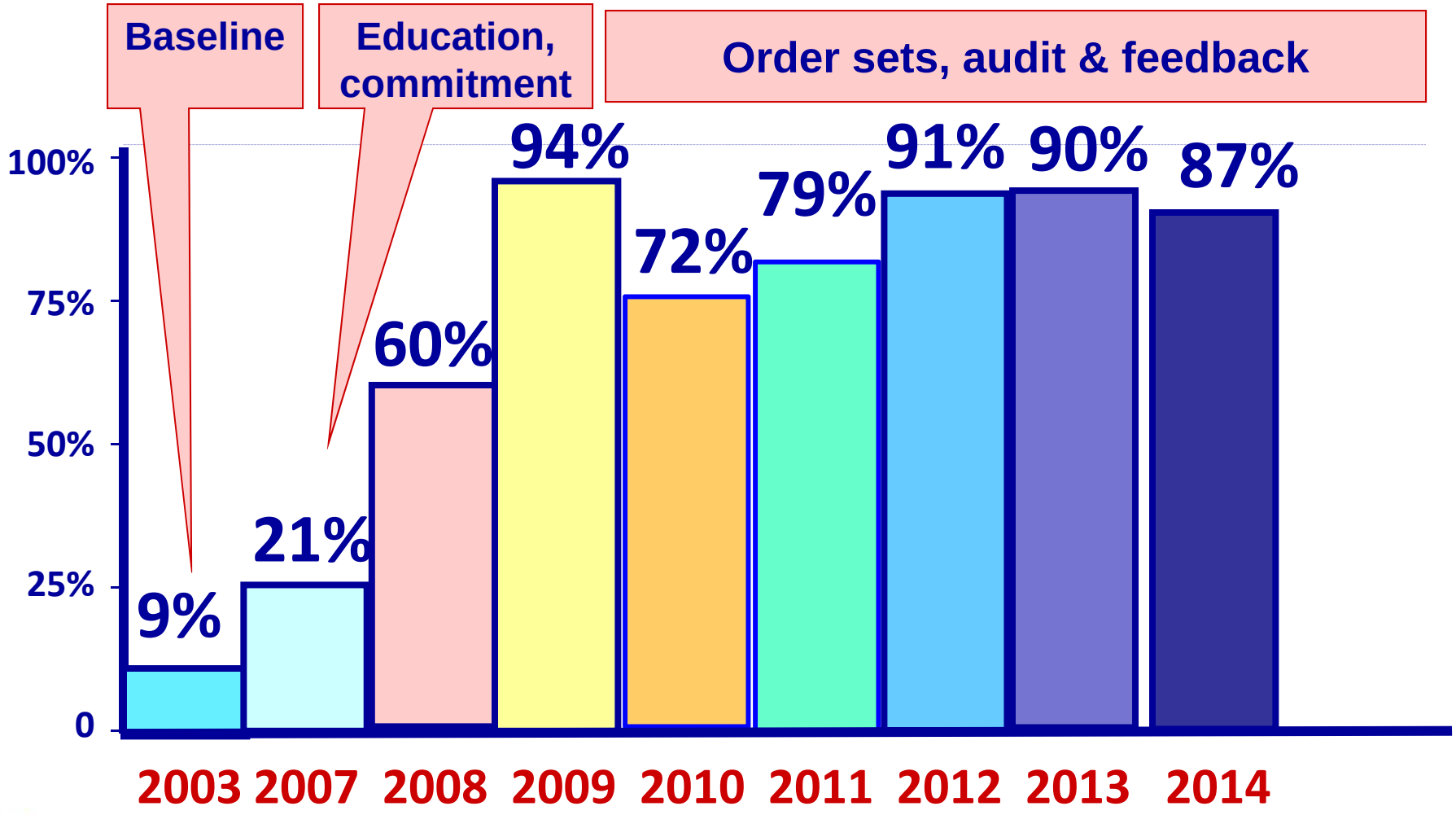


Receiving Appropriate Thromboprophylaxis and Preprinted Order Sets

N=4,518



Appropriate Prophylaxis* Use in General IM Patients



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Improving Thromboprophylaxis

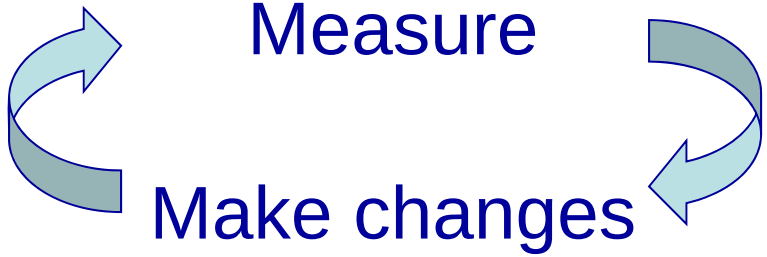
1. Institutional *commitment* + resource support
2. **PLUS** *multidisciplinary* team, committee or sub-
3. **PLUS** *input from similar organizations* (Baycrest, Providence, etc)
4. **PLUS** develop written hospital *policy*
5. **PLUS** embed into *order sets*
6. **PLUS** *audit adherence* with 4.
7. **PLUS** *QI initiative* – education, re-audit + feedback
8. **PLUS** *periodically re-assess* approach

It's all about the patient . . .

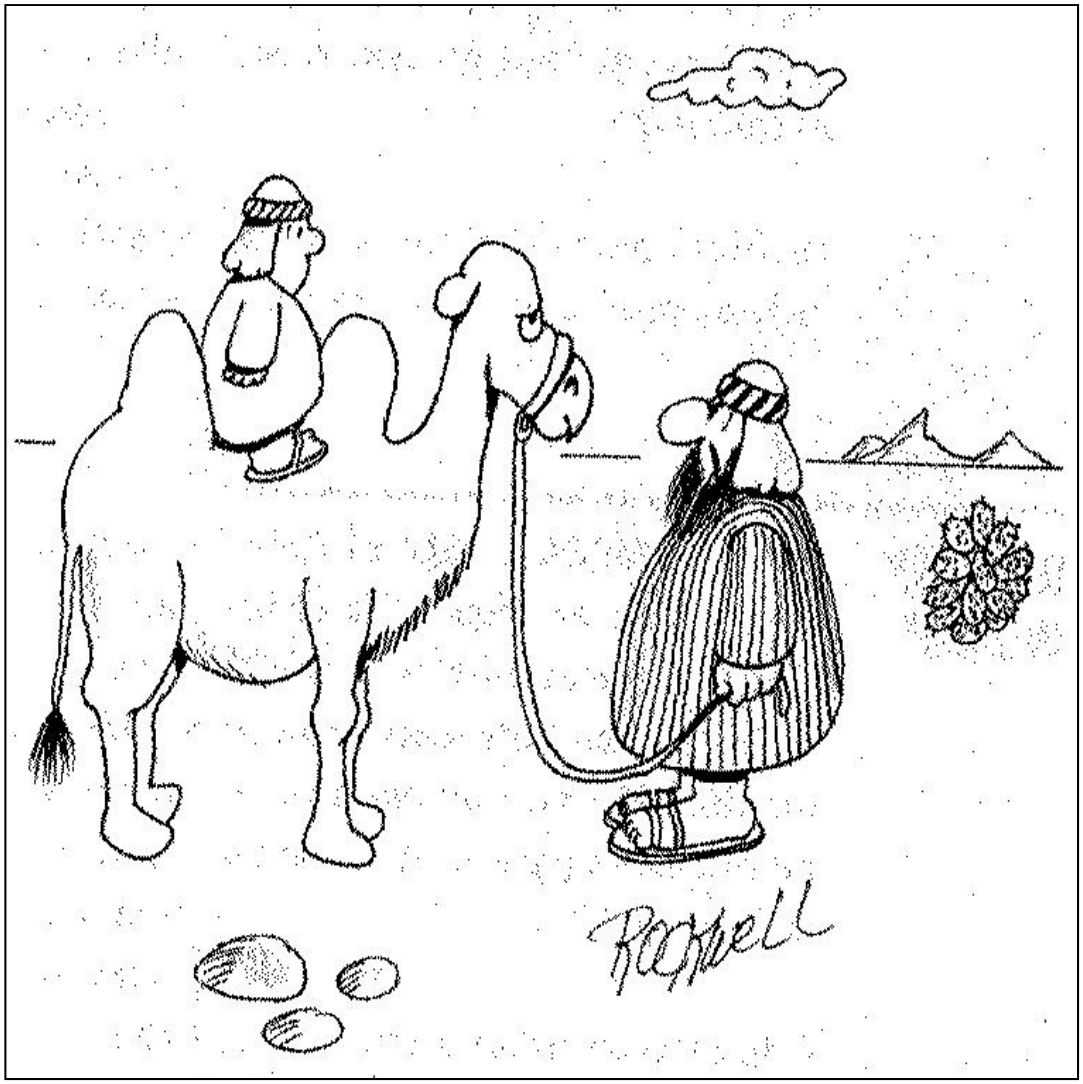
At your hospital, do 100% of patients considered to be at risk for VTE receive appropriate prophylaxis 100% of the time?

□ Yes □ No

Take Home Messages

- National/provincial incentives are important to achieve widespread impact
- Local practice change (= a culture change) requires multi-faceted approaches and a lot of patience
- 

- QI almost always takes longer than you think
- VTE prophylaxis is a real success story in Canada



"Bill, for goodness sake, stop asking if we're there yet. We're nomads*, we'll never be there."

*quality improvement workers

Congratulations, to all of you for making thromboprophylaxis such a success story in Canada

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safer healthcare *now!*

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