Indications and Challenges of Oral Anticoagulation

Ali Taher, MD
Professor of Medicine
Division of Hematology & Oncology
Department of Internal Medicine
American University of Beirut Medical Center
Beirut - Lebanon
Outline of the presentation

• Epidemiology of Venous Thromboembolism (VTE)

• VTE Complications

• Risk assessment models

• Clinical evidence & Guidelines recommendations

• Special population in thromboprophylaxis

• Pros & cons of New Oral Anticoagulants
Annual incidence of VTE in USA

- Incidence-based model to estimate the total annual number of non-fatal and fatal VTE events

**613,423 non-fatal VTE**
- 61.4% DVT
- 38.6% PE

**296,370 fatal VTE**
- 0.8% DVT
- 99.2% PE

Pulmonary Embolism kills more people in Europe*

= 543,454

Pulmonary Embolism

Breast Cancer + AIDS + Highway Accidents + Prostate Cancer = 209,926

PE kills 3 times more medical patients than surgical patients

VTE is a multifactorial disease

THROMBOSIS
A multifactorial accident

- Hypertension
- Diabetes
- Smoking
- Age
- Pregnancy
- Cancer
- Antiphospholipids
- Congenital Thrombophilia
- HIT
- Acute infection
- Hyperlipidaemia
- Others
Long-term complications of VTE: Post-thrombotic syndrome (PTS):

- The overall frequency of PTS after symptomatic DVT ranges from 20% to 50%.
- Severe PTS occurring in 5–10% of patients with DVT.

Importance of Risk Assessment Models (RAM)

**Objectives of RAM**

- **Reduce the Burden of VTE**
- **Identify Patients at Significant Risk of VTE**
- **Simplify Decision Making**
- **Improve the Use of Appropriate Prophylaxis**
- **Cost Containment**
  - Facilitate hospital accreditation
Simplified Risk Assessment Tool: Internal Medicine Patients

VTE RISK FACTORS
- Age >40
- Intensive care unit
- Prior VTE
- Obesity
- Congestive heart failure
- Ischemic stroke
- Chronic lung disease
- Serious infection
- Malignancy
- Respiratory failure
- Thrombophilia
- Inflammatory bowel disease
- Central venous catheter
- Varicose veins
- Collagen vascular disease

EXCLUSION CRITERIA
- Active bleeding
- Hypersensitivity to heparin
- Uncontrolled hypertension
- Renal insufficiency
- Coagulopathy
- Heparin-induced thrombocytopenia
- Spinal tap within 24 hours
- Recent intraocular surgery
- Recent intracranial surgery

Risk Factor Assessment

Restricted mobility plus 1 VTE risk factor?

Prophylaxis Indicated

Risk factors develop during hospitalization?

Daily Reassessment

LMWH QD or LDUH TID

Mechanical Measures

LDUH—low-density unfractionated heparin; LMWH—low-molecular-weight heparin; VTE—venous thromboembolism.

Adapted from American Health Consultants and DVT-Free Clinical Consensus Panel.
First global view of VTE risk and prophylaxis practices

Unprecedented scope:
- 68,183 Patients
- 32 Countries
- 358 Hospitals

N = 68,183 Evaluable patients

1st Endpoint: 52% At Risk for VTE

2nd Endpoint: 50% receiving Prophylaxis

Surgical (n=30,827)
- 64% at Risk for VTE
- 59% receiving prophylaxis
- 40% unprophylaxed!

Medical (n=37,356)
- 42% at Risk for VTE
- 40% receiving Prophylaxis
- 60% unprophylaxed!

ENDORSE: Global Observational Study
The Lancet, Feb. 2008
In our Region: The Double Trouble in VTE management practice
- AVAIL ME Observational Study

1º objective: To identify patients at risk for VTE according to ACCP, and to define the rate of patients receiving appropriate prophylaxis in the ME region

Design: Multinational (7 countries, 25 selected hospitals), cross-sectional survey of the prevalence of VTE risk and prophylaxis use in hospital patients

Patients: 2,266 eligible patients (medical & surgical)

Taher et.al. The AVAIL ME study. J Thromb Thrombolysis. 2010
AVAIL ME results

87.8% at Risk for VTE

44.5% received ACCP Recommended prophylaxis

Surgical
(N=1421)

87.8% at Risk for VTE

44.5% received ACCP “Recommended” prophylaxis

Overall
(N=1421)

95.9% at Risk for VTE

32.1% received ACCP “Recommended” prophylaxis

Medical
(N=845)

Taher et al. The AVAIL ME study. J Thromb Thrombolysis. 2010
Antithrombotic modalities

**Pharmacologic anticoagulant agents:**
- LMWHs
- warfarin
- Pentasaccharides
- Anti-thrombin agents
- Anti-Xa agents

**Mechanical agents**
- Elastic Stockings (ES)
- Graduated Compression Stockings (GCS)

LMWH = low-molecular-weight heparin.
## Advantages of LMWHs over UFH

<table>
<thead>
<tr>
<th></th>
<th>UFH</th>
<th>LMWHs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioavailability (%)</td>
<td>25–30</td>
<td>90–95</td>
</tr>
<tr>
<td>Plasma half-life</td>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td>Effect on platelets</td>
<td>++</td>
<td>+/-</td>
</tr>
<tr>
<td>Effect on haemostasis</td>
<td>++</td>
<td>+/-</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>++</td>
<td>+/-</td>
</tr>
<tr>
<td>Thrombocytopenia</td>
<td>++</td>
<td>+</td>
</tr>
</tbody>
</table>
Extended 4 weeks prophylaxis significantly reduced the incidence of DVT following THA.
We recommend that patients undergoing THA or HFS be given extended prophylaxis for up to 28–35 days after surgery [I, A]

ACCP = American College of Chest Physicians; HFS = hip fracture surgery;
Prolonged thromboprophylaxis after Pelvic/Abdominal cancer surgeries

**ENOXACAN trial**

Enoxaparin 40 mg q.d. (n = 332)

- **1 week**:
  - Total DVT (%): 12.0
  - Number: 20/167

- **4 weeks**:
  - Total DVT (%): 4.8
  - Number: 8/165

**RRR** = 60%

- **p = 0.02**

Dalteparin 5,000 IU q.d.* (n = 343)

- **1 week**:
  - Total DVT (%): 16.3
  - Number: 29/178

- **4 weeks**:
  - Total DVT (%): 7.3
  - Number: 12/165

**p = 0.012**

* With no increase in risk of Bleeding

Cancer patients undergoing elective major abdominal or pelvic surgery should receive post-discharge prophylaxis with LMWH for up to 1 month after surgery [I, A]
**Benefit of Prophylaxis in bed ridden patients with Acute Medical Illness**

<table>
<thead>
<tr>
<th>Study</th>
<th>RRR</th>
<th>Thromboprophylaxis</th>
<th>Patients with VTE, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDENOX (^1)</td>
<td>63%</td>
<td>Placebo Enoxaparin 40 mg QD</td>
<td><strong>14.9(^*)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Placebo</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enoxaparin 40 mg QD</td>
<td></td>
</tr>
</tbody>
</table>

| PREVENT \(^2\) | 45%  | Placebo Dalteparin 5,000 units QD | 5.0 |
|               |      | Placebo                   | 2.8 |

| ARTEMIS \(^3\) | 47%  | Placebo Fondaparinux 2.5 mg QD | 10.5\(^\dagger\) |
|                |      | Placebo                   | 5.6 |

\(^*\)VTE at day 14. \(^\dagger\)VTE at day 15

RRR = Relative Risk Reduction

For acutely ill medical patients prophylaxis with LDUFH 5000 IU tid or LMWH (enoxaparin 40 mg od or dalteparin 5000 U daily) are Grade A recommendations.

ACCP = American College of Chest Physicians; HFS = hip fracture surgery;
As hospital stays shorten, it becomes critical to ensure that prophylaxis continues after discharge to provide the appropriate level of VTE prevention.
ETAPE: same VTE risk factors in out-patients as in hospitalized patients

- Personal history of VTE: 2,409
- Family history of VTE: 2,286
- Chronic cardiac insufficiency: 2,092
- Chronic respiratory insufficiency: 1,830
- History of cancer: 1,631
- History of stroke: 1,015
- Debilitating neurological disease: 869
- History of acute MI: 815

Post-hospitalization prophylaxis

HOME intiation of Prophylaxis or Treatment

1. Pregnant women
2. Curative Treatment of established DVT
3. Secondary prophylaxis in Cancer patients
Looking for The IDEAL ANTICOAGULANT

- Administered orally, one tablet once daily
- Highly effective in reducing thromboembolic events
- Predictable dose response and kinetics
- Low rate of bleeding events
- No routine monitoring of coagulation or platelet count required
- Wide therapeutic
- No dose adjustment required
- Little interaction with food or other drugs
- Low, nonspecific plasma protein binding
- Inhibition of both free and clot-bound activated coagulation factors
Targets of New Anticoagulant Agents

**TF=**tissue factor
1st Oral Anticoagulant (OAC): Ximelagatran

Exanta (Ximelagatran)

Approved indication is for the prevention of VTE in patients undergoing elective hip- or knee-replacement surgery.

Used to be marketed in >9 European countries: Austria, Denmark, Finland, France, Germany, Iceland, Norway, Portugal and Sweden.

Withdrawal in Feb 2006, 2 years from its launch due to Drug-induced Liver Injury

OAC = Oral Anticoagulant
*In addition, the following Vitamin K dependant factors are affected by warfarin:
- Factor VII, Factor IX, Protein C, Protein S

Dabigatran etexilate is currently in clinical development and not yet approved for clinical use.
Direct Thrombin Inhibition

- DTIs block the procoagulant effects of thrombin including:
  - Thrombin’s conversion of fibrinogen to fibrin
  - Thrombin’s platelet activation
  - Thrombin’s up-regulation of clotting factors V, VIII and XI

- The specificity and selectivity means the effects of DTIs are limited only to thrombin resulting in:
  - A linear dose-effect relationship
  - A predictable anticoagulant response
  - No need for dose titration or monitoring
Pradaxa® Profile Summary

- Oral, direct, reversible thrombin inhibitor
- Fast onset and Offset of action (Cmax attained within 0.5-2.0 hrs after administration)
- Has predictable, reproducible PK
- Half life 12-17 hours
- Absolute bioavailability ~6.5%
- No interactions with food
- A fixed dose regimen with no dose titration
- Does not require coagulation or platelet monitoring
- Low potential for drug–drug interactions

Pradaxa®: improving on limitations of current anticoagulants

Dabigatran etexilate is at the forefront of a new generation of oral anticoagulants.

Boehringer Ingelheim is evaluating the efficacy and safety of dabigatran etexilate against current standard therapy in overall >38,000 patients in the extensive RE-VOLUTION® trial programme.

The RE-VOLUTION® trial programme encompasses studies in primary VTE prevention, acute VTE treatment, secondary VTE prevention, stroke prevention in atrial fibrillation, as well as prevention of cardiac events in patients with ACS.

**VENOUS DISORDERS**

- **Primary VTE Prevention**
  - REMODEL™  
    Study of thromboembolism prevention after knee surgery
  - RENOVATE®  
    Study of extended thromboembolism prevention after hip surgery

- **Acute VTE Treatment**
  - RECOVER™  
    Study of treatment of venous thromboembolism
  - RECOVER™ II  
    Study of treatment of venous thromboembolism

- **Secondary VTE Prevention**
  - REMEDY™  
    Study of secondary prevention of venous thromboembolism
  - RESONATE™  
    Study of secondary prevention of venous thromboembolism

**ARTERIAL DISORDERS**

- **Stroke prevention in AF**
  - RELY®  
    Study of stroke prevention in atrial fibrillation

- **Secondary prevention of cardiac events in ACS patients**
  - REDEEM™  
    Study in Acute Coronary Syndrome
1st Approved indication

- Primary prevention of VTE in adult patients that have undergone total knee or total Hip replacement surgery indication.
- Approved in more than 40 European countries & Canada.

N= 3494

Europe/Australia/South Africa

N= 2076
Dabigatran etexilate was as effective as Enoxaparin at preventing VTE & VTE related mortality.

Pradaxa 150mg: 4.3%
Pradaxa 220mg: 3.1%
Enoxaparin 40mg: 3.9%

Eriksson BI. *Lancet* 2007

Pradaxa 150mg: 3.8%
Pradaxa 220mg: 2.6%
Enoxaparin 40mg: 3.5%

Eriksson BI. *J Thromb Haemost* 2007
Dabigatran has a low risk of major bleeding

Incidence and severity of major bleeding events similar to enoxaparin\(^1,2,3\)

Pooled analysis

The incidence of any bleeding with Pradaxa® was also statistically similar to enoxaparin (13.8% vs 13.4%, respectively)\(^3\)

2. Eriksson BI. Lancet 2007
3. Pradaxa® summary of product characteristics
No hepatotoxicity has been identified with Dabigatran. Low and transient increases in ALT for Dabigatran or enoxaparin were observed at any time post baseline after TKR or THR\textsuperscript{1,2}.

### Pradaxa's® recommend dose for VTE prevention

<table>
<thead>
<tr>
<th></th>
<th>Dosing</th>
<th>Duration</th>
<th>Approved Indication</th>
</tr>
</thead>
</table>
| **Total Knee replacement & Total Hip replacement** | 110 mg  
2 caps Once daily. Start with 1 cap on day of surgery. | **TKR : 10 days**  
**THR: 28-35 days** | Primary prevention of VTE events |

**Flexible alternative dose for special patient population**

An effective, lower dose (150 mg) with a favorable safety profile for special patient populations: ¹⁻³

- Patients >75 years of age
- Patients with moderate renal impairment (30–50 ml/min creatinine clearance)
- Patients taking amiodarone

---

**Day of surgery**  
(1–4 hours post-surgery)  
75 mg

**Hip-replacement surgery**  
Days 2 and after  
150 mg once daily
In Case of Bleeding...

✓ No antidote is available

✓ OAC should be discontinued

✓ The source of bleeding should be investigated

✓ Surgical intervention or FFP replacement should be initiated

✓ Optimize hydration, since renally excreted

✓ A r-FVII ?
AF is an increasingly common disorder

• The overall prevalence of AF is increasing, driven by:
  - Aging of populations worldwide
  - Rising prevalence of chronic heart disease
  - Rising prevalence of AF risk factors, e.g. diabetes mellitus

• The number of people with diagnosed AF in industrialized countries (USA, Japan, Germany, Italy, France, UK and Spain) is expected to rise from 6.3 million in 2007 to 7.5 million in 2017\(^1\)

• Hospital admissions for AF have increased by 60% over the past 20 years\(^2\)

1. Decision Resources. Atrial fibrillation. 2008;
Stroke is a frequent complication of AF

Stroke is the leading complication of AF

AF is associated with a 5-fold higher stroke risk overall\(^1\)

AF doubles the risk of stroke when adjusted for other risk factors\(^2\)

Without preventive treatment, each year approximately 1 in 20 patients with AF will have a stroke\(^3\)

- When TIAs and clinically ‘silent’ strokes are considered, the rate of brain ischemia associated with nonvalvular AF exceeds 7% per year

AF is responsible for 15% of all strokes, and AF is the leading cause of embolic stroke\(^4\)

Stroke is a serious complication of AF

Stroke in AF is associated with a heavy burden of morbidity and mortality

AF stroke is usually more severe than stroke due to other causes

The mortality rate for patients with AF is double that in people with normal heart rhythm

RE-LY®: largest AF outcomes trial

RE-LY®: Randomized Evaluation of Long term anticoagulant therapy

- 18,113 patients randomized during 2 years\(^1,2\)
- 50% of enrolled patients are naïve to previous oral AC
- Median treatment duration: 2 years
- 951 centres in 44 countries
- December 2005 to March 2009
- Results first presented at ESC congress 2009 and published online in New England Journal of Medicine on 30 Aug 2009

**150 mg dose v. warfarin**

- Statistically significant reduction in stroke/systemic embolism
- Statistically significant reduction in hemorrhagic stroke
- Statistically significant reduction in vascular mortality
- Comparable rates of major bleeding rates
- Significant reduction in total bleeds, life threatening bleeds and intracranial bleeds

**110 mg dose versus warfarin**

- Comparable rates of stroke/systemic embolism
- Statistically significant reduction in hemorrhagic stroke
- Statistically significant reduction in major bleeding rates
- Significant reduction in total bleeds, life threatening bleeds and intracranial bleeds
Conclusion on Dabigatran

- Dabigatran facilitates in and out-patient treatment and extended prophylaxis
- No coagulation monitoring and no monitoring for thrombocytopenia is required\(^1,2\)
- Oral dosing avoids the burden of antithrombotic injections
- Effective VTE prevention after total knee or hip replacement, comparable with enoxaparin\(^2,3\)
- A safety profile similar to enoxaparin\(^2,3\)
- Break through results with superior efficacy and safety vs Warfarin seen in RE-LY for stroke prevention in atrial fibrillation
- Convenient oral dosing \(^4\)
- Fixed dosing regardless of age, weight, gender and ethnicity\(^1,5\)
- Variety of different indications are currently being investigated under phase III trials in RE-VOULTION

Pradaxa® (dabigatran etexilate). Summary of Product Characteristics.

1st oral direct Factor Xa inhibitor: Rivaroxaban

Direct, specific, competitive F-Xa inhibitor

AT-III independent

Inhibits free and fibrin-bound F-Xa activity

Inhibits thrombin generation

No direct effect on platelet aggregation, and thus, on primary haemostasis

Clinical Program:

RECORD 1,2,3,4

MAGELLAN

EINSTEIN DVT PE EXT

ROCKET AF

ATLAS ACS TIMI 46

ATLAS ACS TIMI 51

1st oral direct Factor Xa inhibitor: Rivaroxaban

Summary of:

Superior VTE prevention vs enoxaparin

Similar safety profile to enoxaparin
How inconsistent Bleeding Definition can influence the perceived safety profile?

EMEA* Definition of Bleeding endpoints:

<table>
<thead>
<tr>
<th>EMEA Definition</th>
<th>Fondaparinux Studies¹⁴,²⁰-²²</th>
<th>Ximelagatran Study¹⁶</th>
<th>Ximelagatran Study²³</th>
<th>Ximelagatran Study¹⁵</th>
<th>Dabigatran Studies¹⁸,²⁴-²⁶</th>
<th>Rivaroxaban Studies¹⁹,²⁷,²⁸</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal bleeding</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Clinically overt bleeding with a decrease in the hemoglobin level of ≥20 g/L</td>
<td>Yes¹ᵇ</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Clinically overt bleeding leading to transfusion of ≥2 units of whole blood or packed cells</td>
<td>Yes¹ᵇ</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Extrasurgical site bleeds only</td>
</tr>
<tr>
<td>Critical bleeding (intracerebral, intraocular, intraspinal, pericardial, or retroperitoneal)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bleeding warranting treatment discontinuation</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Bleeding located at the surgical site</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bleeding leading to reoperation</td>
<td>Yes</td>
<td>Noᵈ</td>
<td>Noᵈ</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

“FDA expressed major concern in terms of safety of Rivaroxaban & suggested additional studies”

Hull et al., Clinical and Applied Thrombosis/Hemostasis, August 2009
Untapped indications of Oral Anticoagulants in clinical practice

No studies in Hip Fracture surgery and other Orthopedic surgeries (except THR/TKR)

No studies in patients undergoing general surgery

No studies in VTE-management in medico-surgical Oncology patients (primary or secondary prophylaxis)

No studies in Pregnancy (Animal studies showed reproductive toxicity)

No studies in Pediatric patients

- Dabigatran: Approved for AFib (Oct. 2010)
- Rivaroxaban: None yet
### Recommended Dosing in Controlled Clinical Trials
(To be adapted in real-life cases)

<table>
<thead>
<tr>
<th>1st Day of Surgery</th>
<th>Hip Replacement Surgery</th>
<th>Knee Replacement Surgery</th>
<th>Atrial Fibrillation</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 mg once daily</td>
<td>110 mg X2 once daily</td>
<td>110 mg X2 once daily</td>
<td>110 mg BID 2 x a.m. or 150 mg BID</td>
</tr>
<tr>
<td></td>
<td>![image]</td>
<td>![image]</td>
<td>![image]</td>
</tr>
<tr>
<td>10 mg OD</td>
<td>10 mg OD</td>
<td>10 mg OD</td>
<td></td>
</tr>
</tbody>
</table>

For each of the antithrombotic drugs, dosing guidelines suggested by the manufacturers should be followed.
## Oral Anticoagulants in patients with Renal Insufficiency

<table>
<thead>
<tr>
<th>Renal Impairment</th>
<th>Dabigatran¹</th>
<th>Rivaroxaban²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate (CrCl 30–50 mL/min) and mild (CrCl 50–80 mL/min) renal impairment</td>
<td>Limited clinical experience. Patients should be treated with caution. The recommended dose is 75mg x 2 taken OD</td>
<td>No dose adjustment is necessary</td>
</tr>
<tr>
<td>Severe renal impairment (CrCl &lt; 30 mL/min)</td>
<td>“Contraindicated”</td>
<td>Not recommended in patients with creatinine clearance &lt;15 ml/min. Use with caution in patients with creatinine clearance 15-29 ml/min</td>
</tr>
</tbody>
</table>

1- Pradaxa PI. BI. 2008. 2- Xarelto PI. Bayer. 2008
### Oral Anticoagulants in patients extreme body weights

<table>
<thead>
<tr>
<th>Body Weight</th>
<th>Underweight patients (Men &lt; 57 kg and women &lt; 45 kg body weight)</th>
<th>Overweight Patients (&gt; 100 Kg body weight)</th>
</tr>
</thead>
</table>
| Dabigatran¹ | - Very limited clinical experience in patients with a body weight <50 kg or >110 kg.  
- No adjustment is necessary but close clinical surveillance is recommended |  |
| Rivaroxaban² | Extremes in body weight (<50 kg or >120 kg) had only a small influence on rivaroxaban plasma concentrations (less than 25%). No dose adjustment is necessary |  |

---

¹ Pradaxa PI. BI. 2008. ² Xarelto PI. Bayer. 2008
## Oral Anticoagulants in Geriatric Patients

<table>
<thead>
<tr>
<th>Name</th>
<th>Dosage and Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dabigatran</td>
<td>Limited clinical experience in patients &gt;75 years. To be treated with caution. Recommended dose is 75mg x2 OD</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>No dose adjustment is necessary</td>
</tr>
</tbody>
</table>

1- Pradaxa PI. BI. 2008. 2- Xarelto PI. Bayer. 2008
Summary on New antithrombotic agents

Advantages:
- Non-parenteral route of administration
- At least as effective as LMWHs
- No routine monitoring
- Potential substitute for AVK in long-term indications

Safety
- So far, acceptable bleeding …
- Awaiting further real life experience …

Practical Limitations
- Long half-life
- No monitoring assay
- No available antidote
- Postoperative oral absorption
Important practical consideration with the use of emerging anticoagulants

“Extrapolation of clinical data to real clinical practice should be interpreted with caution”

“Post-marketing safety issues should be addressed before routine use of NOAC in real practice”
Conclusion

VTE is common and remains of public health concern

Prophylaxis is effective and safe in preventing VTE

Global guidelines do endorse prophylaxis of at-risk population

Risk assessment models are crucial to identify patients at risk

Guideline-based Recommendations are valuable for improving VTE management

NOAC are promising but await real-life experience
Take Home Message:
Looking for an anticoagulant that balances Safety and Efficacy

Nadia Comaneci (1976): Performing in Olympics

Both efficacy and safety are important, and if you fail to balance efficacy and safety, THE PATIENT MAY GET HURT
Thank you for your attention

Indications and challenges of oral anticoagulants

Ali Taher, MD

Professor of Medicine
Hematology & Oncology
Assistant to the Chair - Undergraduate Program
Department of Internal Medicine
American University of Beirut Medical Center

Beirut, November 5, 2010