Venous Thrombosis Prophylaxis

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Disclosure

* I have no relationships with commercial interests.
* I have no conflicts to declare.
* I hereby certify that, to the best of my knowledge, no aspect of my current personal or professional situation might reasonably be expected to significantly affect my views on the subject I am presenting.

Conclusion

* VTE prophylaxis is still essential for patients admitted to hospital
* Extending VTE prophylaxis beyond the hospitalization period is inappropriate for acute medical patients
* Aspirin is not suitable VTE prophylaxis for medical patients but can be prescribed for orthopedic patients
* Aspirin can be considered for patients with unprovoked DVT/PE
* DOACs used for VTE prophylaxis in acutely ill patients led to more bleeding and guidelines recommended against their use for those patients
* Patients with substantial risk of VTE and >4 hours travel might benefit from VTE prophylaxis

Introduction

* It is estimated that over half of hospitalized medical patients are at risk for venous thromboembolism (VTE, i.e., deep vein thrombosis [DVT] and/or pulmonary embolus [PE]) [1]. In addition, it is widely believed that PE is the most common preventable cause of hospital death [2-8].
* Thromboprophylaxis has been shown to reduce the risk of VTE in hospitalized medical and surgical patients.
* Thromboprophylaxis has been reported to reduce the risk of death in surgical patients {14,15,16}, but not in hospitalized medical patients [29-37].

The Risk of VTE

* Surgery
* Acute Medical illness (ICU, Stroke… etc.)
* Cancer
* Pregnancy
* Obesity
* Previous DVT, PE
* Coagulopathy
* Hormone replacement therapy
* Immobilization
* Age

Thrombosis Risk Assessment

* The Padua Prediction Score
* The IMPROVE Risk Score
* The GENEVA Risk Score

Bleeding Risk Assessment

Contraindication for prophylaxis:

* Active bleeding
* Surgery is planned in 6-12 hours
* Spinal neuraxial analgesia
* Patients who have a moderate or severe coagulopathy, and patients with a severe bleeding diathesis or thrombocytopenia (eg. platelet count <50,000/microL or < 100,000/microL plus additional risk factors for bleeding).

Cont'd… Bleeding Risk Assessment

* Validated models for evaluating the risk of bleeding in hospitalized medical patients are lacking:
* Active gastroduodenal ulcer (odds ratio [OR] 4.15; 95% CI 2.21-7.77)
* Bleeding within the three months prior to admission (OR 3.64; 95% CI 2.21-5.99)
* Platelet count <50,000/microL (OR 3.37; 95% CI 1.84-6.18)

https://www.uptodate.com/contents/prevention-of-venous thromboembolic-disease-in-acutely-ill-hospitalized-medical adults?search=vte%20prophylaxis&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H5137702 last accessed feb, 20th 2019

Cont'd… Bleeding Risk Assessment

* Other bleeding risk factors included increased age, hepatic and/or renal failure, intensive care unit stay, presence of a central venous catheter, rheumatic disease, cancer, and male sex (i.e., factors that also increase the risk of VTE).

https://www.uptodate.com/contents/prevention-of-venous thromboembolic-disease-in-acutely-ill-hospitalized-medical adults?search=vte%20prophylaxis&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H5137702 last accessed feb, 20th 2019

DVT Prophylaxis Indication

Moderate and high risk patients:

* For most patients hospitalized with an acute medical illness, who have at least one risk factor for VTE and do not have an increased risk of bleeding

Cont'd… DVT Prophylaxis Indication

Exclusion:

* Low risk patients (young patients admitted for a 12 hour observation following an episode of syncope from hypoglycemia) or
* Contraindicated patients

VTE Prophylaxis Methods

* Non-Pharmacological
* Pharmacological

Intermittent Pneumatic Compression Device (IPC)

* Indicated for patients with contraindication for pharmacological methods(i.e active bleeding)

IPC is contraindicated in:

* leg ischemia caused by peripheral vascular disease,
* leg ulcerations,
* dermatitis, or
* severe leg edema.
* It should not be started in patients who have already been at bed rest or immobilized without VTE prophylaxis for more than 72 hours since stroke onset

Pharmacological Methods

* Unfractionated heparin
* Low Molecular Weight Heparin
* Fondaparinux
* Aspirin
* Warfarin
* Direct Oral Anticoagulants (DOAC)

Acute Medical Patients

* LMHW preferred over UFH: once daily dose, HIT is less, as per some met analysis studies more effective than UFH.
* Fondaparinux: more expensive than others, less risk of HIT, but contraindicated for patients with renal failure
* UFH: preferable for surgical patients admitted and waiting for surgery as shorter half life, useful for patients with renal failure. Better option for obese patients when treating VTE, or PE

Cont'd… Acute Medical Patients

* Aspirin — Although aspirin is highly effective in reducing major arterial thrombotic events, there is little evidence that aspirin and/or other antiplatelet agents (eg., clopidogrel) can effectively prevent venous thromboembolic events in hospitalized medical patients. Although a 1994 meta-analysis suggested that aspirin reduced the incidence of VTE by approximately 20 percent compared with placebo or no treatment {32,33,34}, studies since then have shown either no significant benefit or inferiority when compared with other modalities such as LMW heparin {32,33,34}. Thus, we agree with others that aspirin not be used, either alone or in combination, as prophylaxis against VTE in any medical patient group {32,33,34}.

Cont'd… Acute Medical Patients

* DOAC vs LMWH in acutely ill medical patients: Recommendation 11. In acutely ill hospitalized medical patients, the ASH guideline panel recommends using LMWH over DOACs for VTE prophylaxis (strong recommendation)

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

Cont'd... Acute Medical Patients

Harms and burden of DOAC in acute medical patients:

* In the 3 included trials, use of a DOAC compared with LMWH led to an increased risk for major bleeding (RR, 1.70; 95% CI, 1.02-2.82; ARI, 2 or 8 more hemorrhages per 1000 for 2 representative baseline risks of bleeding [low and high]). The 95% CIs for these absolute effects using baseline risks from Spencer et al were 0 to 4 more per 1000 and 2 to 22 more per 1000, respectively

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

Latest Update from ACCP

MEDICAL NEWS | PHYSICIAN'S FIRST WATCH

January 8, 2016

American College of Chest Physicians Offers New Guidelines on Antithrombosis for VTE

By Kelly Young

Edited by André Sofair, MD, MPH, and William E. Chavey, MD, MS

The American College of Chest Physicians has issued new guidelines on antithrombotic therapy for venous thromboembolism (VTE), including guidance on use of non-vitamin K antagonist oral anticoagulants.

Among the recently changed or added recommendations, published in *Chest*:

- For patients without cancer who have deep vein thrombosis (DVT) of the leg or pulmonary embolism (PE), the guidelines suggest using dabigatran, rivaroxaban, apixaban, or edoxaban instead of vitamin K antagonists for the first 3 months' treatment and beyond.
- Patients with unprovoked proximal DVT or PE who are stopping anticoagulation should receive aspirin to reduce the risk for recurrent VTE, assuming aspirin is not contraindicated.
- For patients who have acute DVT of the leg, compression stockings are not recommended to prevent post-thrombotic syndrome (PTS). However, for patients with PTS symptoms, "a trial of graduated compression stockings is often justified."
- Patients with low-risk PE may be treated at home or receive an early discharge.

VTE Prophylaxis for Orthopaedic Patients

* NICE Guidelines 2018
* ACCP Guidelines
* AAOS Guidelines

AAOS Guidelines

2007:

* LMWH or Warfarin for high risk patients
* Aspirin for low risk patients (No history of DVT/PE, active cancer, coagulopathy, and mobile)
* Fondaparinux is secondary option and can cause more bleeding

2011:

* Unclear about which prophylactic strategy (or strategies) is/are optimal or suboptimal. No recommendation for or against specific prophylactics in these patients

AAOS clinical guideline on preventing venous thrombo- embolic disease in patients undergoing elective hip and knee arthroplasty. Rosemont, IL: American Academy of Orthopaedic Surgeons; 2011.

9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines

Yngve Falck-Ytter, MD; Charles W. Francis, MD; Norman A. Johanson, MD; Catherine Curley, MD; Ola E. Dahl, MD; Sam Schulman, MD, PhD; Thomas L. Ortel, MD, PhD; Stephen G. Pauker, MD; and Clifford W. Colwell Jr, MD

Background: VTE is a serious, but decreasing complication following major orthopedic surgery. This guideline focuses on optimal prophylaxis to reduce postoperative pulmonary embolism and DVT.

Methods: The methods of this guideline follow those described in Methodology for the Development of Antithrombotic Therapy and Prevention of Thrombosis Guidelines: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines in this supplement.

Results: In patients undergoing major orthopedic surgery, we recommend the use of one of the following rather than no antithrombotic prophylaxis: low-molecular-weight heparin; fondaparinux; dabigatran, apixaban, rivaroxaban (total hip arthroplasty or total knee arthroplasty but not hip fracture surgery); low-dose unfractionated heparin; adjusted-dose vitamin K antagonist; aspirin (all Grade 1B); or an intermittent pneumatic compression device (IPCD) (Grade 1C) for a minimum of 10 to 14 days. We suggest the use of low-molecular-weight heparin in preference to the other agents we have recommended as alternatives (Grade 2C/2B), and in patients receiving pharmacologic prophylaxis, we suggest adding an IPCD during the hospital stay (Grade 2C). We suggest extending thromboprophylaxis for up to 35 days (Grade 2B). In patients at increased bleeding risk, we suggest an IPCD or no prophylaxis (Grade 2C). In patients who decline injections, we recom-

Prevention of VTE in orthopedic surgery patients: Antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians evidence-based clinical practice guidelines. Chest 2012;141:e278Se325S.

NICE Guidelines

* Offer VTE prophylaxis to people undergoing elective hip replacement surgery whose risk of VTE outweighs their risk of bleeding. Choose any one of:
  * LMWH for 10 days followed by aspirin[6] (75 or 150 mg) for a further 28 days.
  * LMWHfor 28 days combined with anti-embolism stockings (until discharge).
  * Rivaroxaban
* Secondary option:
  * Apixiban, or dabigatran

National Institute for Health and Clinical Excellence. Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism. https://www.nice.org.uk/guidance/ng89. Last accessed February, 20th 2018

Cont'd... NICE Guidelines

* Elective knee replacement
* Offer VTE prophylaxis to people undergoing elective knee replacement surgery whose VTE risk outweighs their risk of bleeding. Choose any one of:
  * Aspirin (75 or 150 mg) for 14 days.
  * LMW for 14 days combined with anti-embolism stockings until discharge.
  * Rivaroxaban
* Secondary option:
  * Apixiban, or dabigatran

National Institute for Health and Clinical Excellence. Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism. https://www.nice.org.uk/guidance/ng89. Last accessed February, 20th 2018

Nice Guidelines 2018

* Fragility fractures of the pelvis, hip and proximal femur: Offer VTE prophylaxis for a month to people with fragility fractures of the pelvis, hip or proximal femur if the risk of VTE outweighs the risk of bleeding.
* Choose either:
  * LMWH, starting 6–12 hours after surgery
  * Fondaparinux sodium[], starting 6 hours after surgery, providing there is low risk of bleeding.

National Institute for Health and Clinical Excellence. Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism. https://www.nice.org.uk/guidance/ng89. Last accessed February, 20th 2018

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Aspirin or Rivaroxaban for VTE Prophylaxis after Hip or Knee Arthroplasty

D.R. Anderson, M. Dunbar, J. Murnaghan, S.R. Kahn, P. Gross, M. Forsythe, S. Pelet, W. Fisher, E. Belzile, S. Dolan, M. Crowther, E. Bohm, S.J. MacDonald, W. Gofton, P. Kim, D. Zukor, S. Pleasance, P. Andreou, S. Doucette, C. Theriault, A. Abianui, M. Carrier, M.J. Kovacs, M.A. Rodger, D. Coyle, P.S. Wells, and P.-A. Vendittoli

Duration of VTE Prophylaxis

Stroke patients:

* The optimal duration of VTE prophylaxis is uncertain, as the clinical trials have generally employed prophylaxis for two weeks, and longer periods of treatment are not well studied in patients with stroke.
* A subgroup analysis of one randomized trial suggested that longer-term prophylaxis (eg, up to six weeks) with enoxaparin reduced the risk of VTE and increased the risk of major bleeding [28].
* The 2012 ACCP guidelines state that VTE prophylaxis should be initiated as early as possible and be continued during hospitalization or until the patient regains mobility [29].

Duration of VTE Prophylaxis

Acutely sick patients:

* Duration of VTE prophylaxis should ideally be until the patient is fully ambulatory or discharged from the hospital.
* Expert Opinion: select populations should probably receive extended thromboprophylaxis (eg. non-ambulatory patients, patients unable to ambulate independently or mechanically ventilated patients admitted to acute rehabilitation for physical therapy or ventilator weaning).
* Thromboprophylaxis is typically not be given in chronically immobilized patients living at home or in a nursing home [64].

Duration of VTE Prophylaxis Beyond Hospitalization

Patients with spinal cord injury:

* Post-acute hospitalization SCI (ie, typically during inpatient rehabilitation)
* Minimum 8 weeks up to 12 weeks [27-31]

Orthopaedic patients:

* TKA, THA, or HIP fracture (minimum 10- 14 days and can be extended to 35 days)

Cont'd… Duration of VTE Prophylaxis Beyond Hospitalization

Nonorthopaedic surgical only the following category:

* Major abdominal and/or pelvic surgery for cancer. Extended pharmacologic VTE prophylaxis, typically with low molecular weight (LMW) heparin, for VTE up to 12 weeks post discharge. {20-26}.

Thank YOU!

Comfort. Care. Hope

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