Venous Thromboembolism (VTE) Prophylaxis in Acutely Ill Medical Patients

An AC Forum Rapid Resource

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Disclosures & Notification of Support

Acknowledgement of Financial Commercial Support:
Support for this project provided by Janssen Pharmaceuticals, Inc.

The below speaker disclosure has the listed relevant financial relationships with commercial interests:

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Bristol-Myers Squibb (BMS) | Osmosis | Janssen Pharmaceuticals | Pfizer Pharmaceuticals Inc | Novartis | Portola/Alexion Pharmaceuticals | Gilead Sciences

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Portola/Alexion Pharmaceuticals | Bristol-Myers Squibb (BMS) | Pfizer Pharmaceuticals Inc
Background and Scope

• In 2008 the surgeon general issued a Call to Action to prevent DVT and PE and recognized VTE as a significant public health concern.¹

• In 2020, the American Heart Association issued a Call to Action for better implementation of VTE risk stratification, prevention, and tracking.²

• Up to 70-80% of VTE events occur after hospital discharge with length of stay being much shorter now than in seminal studies that used 6-14 days of LMWH.³
VTE in Medically Ill Patients

• Half of VTE events occur due to hospital admission for surgery (24%) or medical illness (22%)
• Risk factors for VTE in hospital include cancer, advanced age, prior VTE, central lines, immobility
• 40% of hospitalized patients have 3 or more risk factors for VTE
• Increase in thrombosis risk in medical inpatients persists 45-60 days after discharge
CY 2021 VTE-1 and VTE-2 eCQMs

Assesses the number of hospitalized adult patients who received VTE prophylaxis (pharmacological or mechanical prophylaxis), or have documentation why no VTE prophylaxis was given for:

• VTE-1: The day of or the day after (1) hospital admission; or (2) the surgery end date for surgeries that start the day of or the day after hospital admission

• VTE-2: The day of or the day after (1) the initial admission (or transfer) to the ICU; or (2) surgery end date for surgeries that start the day of or the day after ICU admission or transfer

**Updates:** CMS updated VTE-1 and 2 logic to include rivaroxaban as approved medication administration for VTE prophylaxis in medically ill patients as it has FDA approval
## Bottom Line

<table>
<thead>
<tr>
<th>DO</th>
<th>DON'T</th>
<th>CONSIDER</th>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Use VTE risk assessment at admission, throughout hospitalization, and at discharge³</td>
<td>• Do not give all patients VTE prophylaxis indiscriminately without risk assessment</td>
<td>• Extended post-discharge VTE prophylaxis in appropriate patients (see criteria below)⁵</td>
<td>• This information is based on expert opinion in the absence of robust data</td>
</tr>
<tr>
<td>• Use bleeding risk assessment⁴</td>
<td>• Do not use combined pharmacologic and mechanical prophylaxis in medically ill patients³</td>
<td></td>
<td>• Some patients will be appropriate for a different approach</td>
</tr>
<tr>
<td>• Use pharmacologic prophylaxis in patients with high VTE risk and acceptable bleeding risk³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Use mechanical prophylaxis in patients with high VTE risk and high bleeding risk³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Use low molecular weight heparin (LMWH) instead of unfractionated heparin (UFH) in patients with adequate renal function³</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Background:
In 2008 the surgeon general issued a Call to Action to prevent DVT and PE and recognized VTE as a significant public health concern.

In 2020, the American Heart Association issued a call to action for better implementation of VTE risk stratification, prevention and tracking.

### Scope:
Hospitalized non-surgical medically and critically ill patients
Considerations for extended duration thromboprophylaxis (EDT) among high risk medically ill patients at discharge
Case Part 1

65-year-old admitted to the medical ward for CHF exacerbation
No history of VTE, cancer or thrombophilia
Normal renal and liver function
No increased bleeding risk
Normal weight
COVID-19 negative

Would you prescribe VTE prophylaxis?

a) Yes
b) No
### Examples of Risk Assessment Models

Several VTE risk assessment models (RAMs) exist, none of which have been extensively studied in impact analysis. As such, contemporary guidelines do not give preference to any single RAM. Rather, it is suggested to use a validated RAM to assess both VTE risk and bleeding risk to identify patients who are (and who are not) at sufficient risk for prophylaxis and preferred treatment modality (pharmacologic vs mechanical).

<table>
<thead>
<tr>
<th>Risk Factor Details</th>
<th>Risk Factor</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced mobility</td>
<td>Previous VTE</td>
<td>3</td>
</tr>
<tr>
<td>Active cancer</td>
<td>Known thrombophilia</td>
<td>2</td>
</tr>
<tr>
<td>Previous VTE</td>
<td>Malignancy (treated or untreated w/in 6 months)</td>
<td>1</td>
</tr>
<tr>
<td>Known thrombophilic condition</td>
<td>Age &gt;60 yrs</td>
<td>2</td>
</tr>
<tr>
<td>Recent trauma and/or surgery (&lt;1mo)</td>
<td>Immobilization ≥7d</td>
<td>1</td>
</tr>
<tr>
<td>Elderly age (&gt;70yr)</td>
<td>ICU/CCU stay</td>
<td>1</td>
</tr>
<tr>
<td>Heart and/or respiratory failure</td>
<td>Age &gt;60yr</td>
<td>2</td>
</tr>
<tr>
<td>Acute MI or ischemic stroke</td>
<td>GFR &lt;30 mL/min/m²</td>
<td>2.5</td>
</tr>
<tr>
<td>Ongoing hormonal tx</td>
<td>GFR 30-59 mL/min/m²</td>
<td>1</td>
</tr>
<tr>
<td>Obesity (BMI&gt;30)</td>
<td>Age ≥ 85yr</td>
<td>3.5</td>
</tr>
<tr>
<td>Acute infection and/or rheumatologic disorder</td>
<td>Age 40-84 yr</td>
<td>1.5</td>
</tr>
<tr>
<td>Bleeding in prior 3 months</td>
<td>Admission platelets ≤50,000</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Low Risk: Do not require prophylaxis

#### High Risk: Should receive in-hospital prophylaxis

#### High Bleeding Risk: Might indicate preference for mechanical prophylaxis while bleeding is high; reassessment is warranted
65-year-old admitted to the medical ward for CHF exacerbation
No history of VTE, cancer or thrombophilia
Normal renal and liver function
No increased bleeding risk
Normal weight
COVID-19 negative

What would you do for VTE prophylaxis?

a) Heparin 5000 units SQ tid
b) Enoxaparin 40 mg SQ daily
c) Pneumatic compression devices
d) No prophylaxis needed
# Pharmacologic Dosing Options

<table>
<thead>
<tr>
<th>Enoxaparin</th>
<th>Dalteparin</th>
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<tbody>
<tr>
<td><strong>Standard Dosing</strong></td>
<td><strong>Standard Dosing</strong></td>
</tr>
<tr>
<td>40mg SC once daily</td>
<td>5000 units SC once daily</td>
</tr>
<tr>
<td>30mg SC once daily</td>
<td>Avoid use</td>
</tr>
<tr>
<td>Avoid use</td>
<td>Avoid use</td>
</tr>
<tr>
<td>Obese patients (BMI &gt; 40kg/m²)</td>
<td>7500 units SC once daily¹⁶,¹¹</td>
</tr>
<tr>
<td>40 mg BID</td>
<td>7500 units SC once daily</td>
</tr>
<tr>
<td>60mg BID (BMI &gt;47kg/m²)⁶,¹²</td>
<td>Avoid use</td>
</tr>
<tr>
<td>0.5mg/kg QD⁸</td>
<td></td>
</tr>
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</table>

## Unfractionated Heparin (UFH)

| Standard Dosing | 5000 units SC 8-12 hours |
| Obese patients (BMI >40kg/m²) | 7500 units BID-TID*⁹,¹⁰ |
| *Evidence is limited. |

### Fondaparinux

| Standard Dosing | 2.5mg SC once daily |
| Wt <50 kg or CrCL< 30 mL/min | Avoid use |

### Rivaroxaban* |

| Standard Dosing | 10mg once daily continued (Extended Duration) for 31-39 days total |

*Indicated for use during hospitalization and post-hospital discharge in adults admitted for an acute medical illness who are at risk for thromboembolic complications due to moderate or severe restricted mobility and other risk factors for VTE and not at high risk of bleeding (refer to criteria chart)

Cockcroft-Gault should be used to calculate CrCl
After 3 days in the hospital, the patient develops pneumonia, sepsis and requires intubation and mechanical ventilation.

Would you prescribe VTE prophylaxis?

a) Yes
b) No

What would you do for VTE prophylaxis?

a) Heparin 5000 units tid
b) Enoxaparin 40 mg daily
c) Pneumatic compression
d) No prophylaxis needed

They are extubated and discharged from ICU 5 days later back to the floor. Kidney and liver function are normal.

Would you prescribe VTE prophylaxis?

a) Yes
b) No

What would you do for VTE prophylaxis?

a) Heparin 5000 units tid
b) Enoxaparin 40 mg daily
c) Pneumatic compression
d) No prophylaxis needed
Case 3

3 days after returning to the floor the patient is ready for discharge, CHF and pneumonia are improved. Patient is weak but does not require physical therapy.

Would you prescribe extended-duration prophylaxis EDT?

a) Yes
b) No
# Extended Duration Thromboprophylaxis (EDT)\(^5\)

**Rationale:** Up to 70-80\% of VTE occur after hospital discharge. Length of stay is now much shorter than in seminal studies that utilized 6-14 days of LMWH\(^7\)

The following criteria pertain to rivaroxaban, which is currently the only commercially available, FDA-approved agent for EDT.

<table>
<thead>
<tr>
<th>Consider rivaroxaban 10 mg PO daily for a total of up to 39 days in patients who meet selection criteria below:</th>
</tr>
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<tbody>
<tr>
<td><strong>For patients aged &gt;60 and hospitalized for (\geq 1) of the following acute medical conditions:</strong></td>
</tr>
<tr>
<td>Decompensated heart failure • Respiratory insufficiency or COPD exacerbation • Infectious or inflammatory disease • Ischemic stroke with lower extremity paresis and reduced mobility</td>
</tr>
<tr>
<td><strong>OR</strong></td>
</tr>
<tr>
<td><strong>For patients aged 40-59, hospitalized for (\geq 1) of the above acute medical illnesses AND Have history of prior VTE or active cancer AND (\geq 1) of the below additional VTE risk factor(s):</strong></td>
</tr>
<tr>
<td>Previous VTE or superficial vein thrombosis • History of NYHA Class III or IV HF • Concomitant acute infection • Obesity (BMI &gt;35) • History of cancer • Inherited or acquired thrombophilia • Current use of erythropoiesis-stimulating agent • Hormone therapy</td>
</tr>
</tbody>
</table>

**Exclusion Criteria:**

Contraindications to anticoagulant prophylaxis • Creatinine Clearance <30mL/min • Concomitant combined P-gp and strong CYP3A4 inhibitors and inducers • Pregnant or breastfeeding • **Currently on dual antiplatelet therapy (DAPT)** • Active bleeding within the last 3 months • Gastrroduodenal ulcers within the last 3 months • History of bronchiectasis, pulmonary cavitation, or pulmonary hemorrhage • Active cancer (undergoing acute in-hospital cancer treatment)

*Bolded exclusion criteria have been linked to increased fatal or major bleeding events\(^5\)*
Anticoagulation Stewardship Considerations

• Confirmation of access to medication (e.g., insurance coverage)
• Clear documentation of a finite duration of therapy
• Education and empowerment of patient/family on appropriate use

AC Forum Resource-Order Set
Support for this project was provided by Janssen Pharmaceuticals, Inc.

The content was developed independently by the Anticoagulation Forum and the funder had no input in the content of the Rapid Resource or webinar.