VTE prophylaxis for the medically ill patient

**Administration**

**DOCUMENT PURPOSE**

This order set is intended to facilitate standardized venous thromboembolism (VTE) prophylaxis risk stratification of hospitalized medically ill patients for:

- Hospital-acquired VTE
- Prophylaxis-associated bleeding on anticoagulation administration
- Prescription of risk-appropriate VTE prophylaxis

### VTE Risk Assessment

See appendices for risk assessment tools (IMPROVE, Padua, Caprini) to assist with VTE risk assessment.

- [ ] High or moderate risk of VTE
- [ ] Low risk of VTE

*If the patient is low risk for VTE per your hospital’s Risk Assessment Model and is not anticipated to experience severe immobility, then no VTE prophylaxis (pharmacological or mechanical) is necessary. Reassess your patients’ VTE risk status as clinically indicated.*

#### LOW VTE RISK BASED ON RISK ASSESSMENT SCORES

- [ ] Improve 4 Score: 0-1
- [ ] Improve 7 Score: 0-1
- [ ] Padua Score: 0-3
- [ ] Caprini Score: 0-2

#### HIGH OR MODERATE VTE RISK BASED ON RISK ASSESSMENT SCORES

- [ ] Improve 4 Score ≥2
- [ ] Improve 7 Score: ≥2
- [ ] Padua Score: ≥4
- [ ] Caprini Score: ≥2
Document allergies on approved form and ensure medication reconciliation has been reviewed as per organizational process

**VTE prophylaxis for the medically ill patient**

<table>
<thead>
<tr>
<th>Bleeding Risk Assessment</th>
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<tbody>
<tr>
<td><strong>IMPROVE Bleeding Risk Factor</strong></td>
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<tr>
<td>□ Moderate renal failure (GFR 30-59)</td>
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<tr>
<td>□ Sex: Male vs Female</td>
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<tr>
<td>□ Age: 40 – 84</td>
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<tr>
<td>□ Current cancer</td>
</tr>
<tr>
<td>□ Rheumatic diseases</td>
</tr>
<tr>
<td>□ CV catheter</td>
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<tr>
<td>□ ICU / CCU stay</td>
</tr>
<tr>
<td>□ Severe renal failure (GFR &lt; 30 ml/min)</td>
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<tr>
<td>□ Hepatic failure (INR &gt; 1.5)</td>
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<tr>
<td>□ Age ≥ 85</td>
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<tr>
<td>□ Admission platelets &lt; 50 x 10⁹</td>
</tr>
<tr>
<td>□ Bleeding prior 3 months</td>
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<tr>
<td>□ Gastro-duodenal ulcer</td>
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</table>

**Total Score**

Scores ≥ 7 indicate higher bleeding risk and caution with pharmacologic prophylaxis. Reassess candidacy for anticoagulant or mechanical prophylaxis as clinically indicated.
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VTE prophylaxis for the medically ill patient

Baseline Information

ASSESSMENTS
☐ aPTT _________
☐ Prothrombin time (PT) ________________
☐ HGB _________
☐ PLTS _________  ☐ AST _________  ☐ ALT _________

RENAL FUNCTION
☒ Calculate estimated CrCl using the Cockcroft-Gault equation
\[
\text{Estimated CrCl} = \left(\frac{140 - \text{Age}}{72 \times \text{serum creatinine}}\right) \times \text{actual weight in kg} \times 0.85 \text{ if female}
\]
☐ Age: ________________
☐ Actual body weight: ________________ (kg)
☐ Gender: ________________
☐ Serum Creatinine: ________________ (mg/dL)

*Monitor renal functioning during hospital stay
☐ Estimated CrCl: ________________ (mL/minute)

Risk-Appropriate VTE Prophylaxis Orders

Please review inclusion criteria below in SECTION X to determine if your patient may benefit from in-hospital and extended prophylaxis with betrixaban. For patients at high risk of VTE, and low risk for bleeding, consider extended prophylaxis with betrixaban for up to 42 days.

If patients do not meet criteria, likely avoid use of betrixaban and post-discharge prophylaxis.

VTE PROPHYLAXIS OPTIONS (SELECT ONE):
☐ Oral
☐ For patients that meet criteria for extended prophylaxis, see SECTION X
☐ Parenteral
For CrCl > 30ml/min  ☐ Dalteparin 5000 u SC once daily
☐ Enoxaparin 40 mg SC once daily
☐ Fondaparinux 2.5 mg SC once daily

For CrCl 15-29 ml/min  ☐ Enoxaparin 30 mg SC once daily

For CrCl < 15 ml/min  ☐ Unfractionated heparin 5000 u SC  ☐ bid  ☐ tid
☐ Mechanical prophylaxis
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<table>
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<tr>
<th>Risk-Appropriate VTE Prophylaxis Orders Continued</th>
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<tbody>
<tr>
<td>SECTION X: PATIENT CRITERIA FOR USE OF BETRIXABAN IN-HOUSE AND FOR EXTENDED PROPHYLAXIS</td>
</tr>
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</table>

- No invasive procedures are planned in the next 30 days
- No contraindications to anticoagulant prophylaxis
- Creatinine clearance > 30 ml/min
- Not taking concomitant therapy with a strong PGP inhibitor
- Non-pregnant or breastfeeding
- Not currently on dual antiplatelet therapy (DAPT)
- Confirmation of insurance coverage of betrixaban for duration of prophylactic regimen and hospitalized with acute NYHA Class III/IV heart failure, respiratory failure, acute infectious disease or rheumatic illness or ischemic stroke with lower extremity paresis, and severe immobility (bed or chair bound 100% of the day) for at least 1 day and moderate immobility (bed or chair bound 50% of day) for at least 3 days

AND ONE OF THE FOLLOWING:

- Age 75+
- Age 60-74 and two additional VTE risk factor
- Age 40-59 and a prior VTE or active cancer and one additional risk factor

RISK FACTORS

- Previous VTE or superficial vein thrombosis
- History of NYHA Class III or IV HF
- Concomitant acute infection
- Obesity (BMI >35)
- History of cancer
- Inherited or acquired thrombophilia
- Current use of erythropoiesis-stimulating agent
- Hormone therapy

BETRIXABAN VTE PROPHYLAXIS OPTIONS (SELECT ONE):

- Betrixaban 160 mg PO on day one, then 80 mg daily for 35-42 days (CG CrCl >30ml/min)

ADJUSTED DOSING

- Betrixaban 80 mg PO on day one, then 40 mg daily for 35-42 days renal dosing (CG CrCl 15-30ml/min) or taking strong PGP inhibitor
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### Additional Orders

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Reference Document Only

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References


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References Continued

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Appendices: VTE Risk Assessments

IMPROVE: 7- ELEMENT IN-HOSPITAL RISK MODEL

VTE RISK FACTORS
3 POINTS  2 POINTS  1 POINT
☐ Previous VTE  ☐ Thrombophilia  ☐ Age > 60 years
☐ Lower limb paralysis  ☐ Immobilization ≥ 7 days  ☐ ICU / CCU stay
☐ Current cancer

IMPROVE 7 VTE Score:
Scores 0-6 are low risk with no indication for prophylaxis
Scores ≥ 7 are high risk and warrant prophylaxis

IMPROVE: 4-ELEMENT IN-HOSPITAL RISK MODEL

VTE RISK FACTORS
3 POINTS  2 POINTS  1 POINT
☐ Previous VTE  ☐ Thrombophilia  ☐ Age > 60 years
☐ Current cancer

IMPROVE 4 VTE Score:
Scores 0-2 are low risk with no indication for prophylaxis
Scores ≥ 2 are high risk and warrant prophylaxis
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### VTE prophylaxis for the medically ill patient

**CAPRINI SCORE**

Below depicts the different weighted points for the risk factors included in the Caprini Score:

#### 5 POINTS
- Stroke (in the previous month)
- Fracture of the hip, pelvis, or leg
- Elective arthroplasty
- Acute spinal cord injury (in the last month)

#### 3 POINTS
- Age ≥ 75 years
- Prior episode of VTE
- Positive family history for VTE
- Prothrombin 20210A
- Factor V Leiden
- Lupus anticoagulants
- Anticardiolipin antibodies
- High homocysteine in the blood
- Heparin induced thrombocytopenia
- Other congenital or acquired thrombophilia

#### 2 POINTS
- Age: 61 – 74 years
- Arthroscopic surgery
- Laparoscopy lasting more than 45 minutes
- General surgery lasting more than 45 minutes
- Cancer
- Plaster cast
- Bed bound for more than 72 hours
- Central venous access

#### 1 POINT
- Age 41 – 60 years
- BMI > 25 kg/m^2
- Minor surgery
- Edema in the lower extremities
- Varicose veins
- Pregnancy
- Post-partum
- Oral contraceptive
- Hormonal therapy
- Unexplained or recurrent abortion
- Sepsis (in the previous month)
- Serious lung disease such as pneumonia (in the previous month)
- Abnormal pulmonary function test
- Acute myocardial infarction
- Congestive heart failure (in the previous month)
- Bed rest
- Inflammatory bowel disease

**Note:** The Caprini score is calculated by adding the scores of all factors present in the patient. The Caprini score is interpreted in the following way:
- Total score of 0-1: Low risk of VTE
- Total score of ≥2: High/moderate risk of VTE
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<th>ACTION</th>
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**Appendixes: VTE Risk Assessments Continued**

**PADUA PREDICTION SCORE**

### 3 POINTS
- ☐ Active cancer
- ☐ Previous VTE
- ☐ Reduced mobility
- ☐ Thrombophilic condition

*Active Cancer:* local or distant metastases and with chemo or radiotherapy in previous 6 months

*Mobility:* anticipated bed rest with bathroom privileges for at least 3 days

### 2 POINTS
- ☐ Recent (< 1 month) trauma / surgery

### 1 POINT
- ☐ Age ≥ 70 years
- ☐ Heart or respiratory failure
- ☐ Acute infection or rheumatologic disorder
- ☐ BMI ≥ 30
- ☐ Ongoing hormonal treatment
- ☐ Acute myocardial infarction or ischemic stroke

**Padua Scores:**
Scores 0-3 are low risk and do not warrant prophylaxis.
Scores ≥4 are high risk for VTE and subsequent complications; recommendation for thromboprophylaxis.
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Appendixes: VTE Risk Assessments Continued

**APEX CRITERIA**

**VTE Risk Factors:**
- Hospitalized with acute NYHA Class III/IV heart failure, respiratory failure, acute infectious disease or rheumatic illness or ischemic stroke with lower extremity paresis, and;
- Severe immobility = 100% bed or chair rest for at least 1 day and anticipated severe or moderate immobility= 50% of time at bed or chair rest with bathroom privileges for at least 4 days, and;
- Age and additional VTE risk factors:
  - ≥ 75 years old
  - 60 to 74 years old, plus D-dimer ≥ 2x ULN OR two of the following risk factors
  - 40 to 59 years old, plus history of VTE OR history of cancer, plus D-dimer ≥2x ULN OR one of the following risk factors

**RISK FACTORS:**
- Previous VTE or superficial vein thrombosis
- History of NYHA Class III or IV HF
- Concomitant acute infection
- Obesity (BMI >35)
- History of cancer
- Inherited or acquired thrombophilia
- Current use of erythropoiesis-stimulating agent
- Hormone therapy

*BMI = body mass index; HF = heart failure; NYHA = New York Heart Association; ULN = upper limit of normal*