**Protocol:** Adult DVT Chemoprophylaxis

**Category:** Clinical Practice

**Protocol Number:** BC-2018-3

**Approval Date:** February 1, 2018

**Review Date:** February 1, 2019

### Applicable to
- [x] VUH
- [ ] Children’s
- [ ] DOT
- [ ] VMG Off-site locations
- [ ] VMG
- [ ] VPH
- [ ] Other

### Team Members Performing
- [ ] All faculty & staff
- [x] Faculty & staff providing direct patient care or contact
- [x] MD
- [x] House Staff
- [x] APRN/PA
- [ ] RN
- [ ] LPN

### Other:
- [ ] Faculty & staff providing direct patient care or contact

### Content Experts

**Authors:**
- Callie Thompson, MD
- Sarah Folliard, ARNP

**Date reviewed & accepted:**
- MDBC
- October 5, 2017
I. Purpose:

Burn patients are at an increased risk of venous thromboembolism (VTE) due to burn induced coagulation changes as well as many of the risk factors native to all hospitalized patients\(^2\). The purpose of this protocol is to prevent VTE as a complication to any hospitalized burn patient.

II. Population:

Adult patients with cutaneous burns or inhalation injury admitted to Vanderbilt University Medical Center (VUMC)

III. Risk Factors:

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>High Risk Factors</th>
<th>Very High Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Age &gt; 40 years</td>
<td>• Inhalation injury</td>
<td>• Spinal cord injury with paraplegia or quadriplegia</td>
</tr>
<tr>
<td>• Central venous access</td>
<td>• Age &gt; 60 years</td>
<td>• Complex or multiple (≥ 2) lower extremity fractures</td>
</tr>
<tr>
<td>• Blood transfusions (≥4 units)</td>
<td>• ISS &gt; 15</td>
<td>• Major pelvic fracture</td>
</tr>
<tr>
<td>• Surgical procedure within 72 hrs</td>
<td>• GCS &lt; 9 for &gt; 4 hours</td>
<td>• Multiple (≥ 3) long bone fractures (≥ 1 in the lower extremity)</td>
</tr>
<tr>
<td>• Immobilization</td>
<td>• Major venous injury/repair</td>
<td>• Age ≥ 75 years with any high-risk factor</td>
</tr>
<tr>
<td>• Malignancy</td>
<td>• PMH of venous thromboembolism (VTE)</td>
<td></td>
</tr>
<tr>
<td>• Extensive soft tissue trauma</td>
<td>• Lower extremity fracture</td>
<td></td>
</tr>
<tr>
<td>• Hormone therapy</td>
<td>• Multiple spinal fractures</td>
<td></td>
</tr>
<tr>
<td>• Obesity</td>
<td>• Pregnancy</td>
<td></td>
</tr>
<tr>
<td>• Burn wound infection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV. Assessment:

A. Physical Exam Findings
   1. PE- tachycardia, tachypnea, mental status changes, diaphoresis
   2. DVT- extremity pain, fever, localized edema, warmth/erythema

B. Lab and Radiology Findings
   1. Arterial Blood Gas – respiratory alkalosis, hypoxemia
   2. Chest X-ray- nonspecific, peripheral wedge defect
   3. Extremity Duplex – occlusive/non-occlusive thrombus
   4. CT Angio Chest – filling defect(s)
V. Intervention/Treatment:

A. All burn patients, unless otherwise specified, should receive VTE prophylaxis with enoxaparin (Lovenox) 30 mg SQ q12 hr within 24 hours of admission.

B. Obesity: For patients with a BMI of ≥ 40 kg/m², starting enoxaparin dose is 40 mg Q 12 hrs.

C. For patients with > 20% TBSA burn injury with either high risk or very high-risk factors, chemoprophylaxis will be continued until hospital discharge. For patients with impaired mobility who undergo inpatient rehabilitation, chemoprophylaxis is continued.

D. No doses of enoxaparin will be held for operative procedures unless requested by the operating attending.

VI. Exceptions to VTE Prophylaxis Protocol

A. Renal Impairment: For patients with a significant rise in SrCr (> 50%) or a creatinine clearance < 30 mL/min, enoxaparin may be renally adjusted to 30 mg daily or subcutaneous heparin 5000 units q8 hours may be substituted.
   1. For patients on renal replacement therapy, heparin 5000 units q8 hours is recommended.

B. Traumatic brain injury and spinal cord injury excluded by the Trauma and Surgical Critical Care VTE Protocol (attached)

VII. LMWH Anti-factor Xa (Anti- Xa) Level Monitoring

A. An Anti-Xa level should be drawn in patients with the following characteristics:
   1. Burn ≥20% TBSA
   2. Weight ≥ 180 kg and any risk factor (all categories)
   3. BMI >40kg/m2 and any HIGH risk factor
   4. Anyone with 2 or more high risk or very high risk factors or 3 total of any category of risk factor
   5. Patients with concomitant trauma
      i. Spinal cord injury with paraplegia, quadriplegia
      ii. Complex or multiple (≥ 2) lower extremity fractures
      iii. Major pelvic fracture
      iv. Multiple (≥ 3) long bond fractures or ≥ 1 lower extremity fracture

B. Anti-xa level peaks should be drawn 4 hours after the administration of enoxaparin. These labs should be ordered after the third dose of enoxaparin.
1. To order: LMW Heparin Assay (must be timed correctly)
2. Goal peak is 0.2-0.4 IU/mL
3. Once the goal range is reached, no further monitoring needed.
4. Maximum dosing for enoxaparin is 1mg/kg BID (therapeutic dose). If that dose is reached and assay is still not in goal range, a hematology consult should be considered for heparin resistance and potential alternative therapeutic options.

VIII. Considerations

A. IVC Filter Placement
   1. A prophylactic IVC filter may be considered in high risk burn patients with a contraindication, failure, or complications of anticoagulation.
   2. Indications for a therapeutic IVC filter include patients with a known PE or lower extremity DVT and a contraindication, failure, or complication of anticoagulation.

IX. References: