VANDERBILT UNIVERSITY MEDICAL CENTER

Guideline: Burn Unit Adult Venous Thromboembolism (VTE) Prophylaxis

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I. **Purpose**

To prevent pulmonary embolism (PE) and deep vein thrombosis (DVT) in burn patients

II. **Risk Factors**

Risk Factors	High Risk Factors	Very High Risk Factors
• Burn 10-19% TBSA • Age > 40 years • Central venous access • ISS > 9 • Blood transfusions • Surgical procedure within 72 hrs • Immobilization • Malignancy • Extensive soft tissue trauma • Hormone therapy • Obesity • AIS ≥ 3 (any region)	• Burn 20-39% TBSA • Inhalation injury • Age > 60 years • ISS > 15 • GCS < 9 for > 4 hours • Major venous injury/repair • PMH of venous thromboembolism (VTE) • Lower extremity fracture • Multiple spinal fractures • Pregnancy	• Burn ≥40% TBSA • Spinal cord injury with paraplegia or quadriplegia • Complex or multiple (≥2) lower extremity fractures • Major pelvic fracture • Multiple (≥ 3) long bone fractures (≥ 1 in the lower extremity) • Age ≥75 years with any high risk factor) • COVID-19 positive

III. **VTE Prophylaxis Protocol for Burn Patients**

A. All burn patients, unless otherwise specified, should receive VTE prophylaxis with weight-based enoxaparin (Lovenox) on admission.

Current patient weight	**SUBQ Enoxaparin initial dose**	**Routine LMWH Level Monitoring Required**
<50 kg	30 mg q12h	Yes
50 – 89 kg	30 mg q12h	No
90 – 129 kg	40 mg q12h	Yes
130 – 179 kg	60 mg q12h	Yes
≥ 180 kg	80 mg q12h	Yes

B. If receiving subcutaneous heparin, patients with a BMI ≥ 40 kg/m^2 and who do not have an epidural catheter or paravertebral block in place, a higher dose of 7500 units q8h is recommended.

C. VTE prophylaxis should NOT be held for patients with an elevated baseline INR due to liver dysfunction.

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

IV. **Exceptions to VTE Prophylaxis Protocol**

A. Renal Impairment

- For patients with a significant rise in SCr (> 50%) or a creatinine clearance < 30 mL/min, enoxaparin may be renally adjusted to once daily dosing or subcutaneous heparin 5000 units Q 8 hrs may be substituted for enoxaparin.
- For patients on renal replacement therapy, subcutaneous heparin 5000 units Q 8 hrs isrecommended over enoxaparin.

B. Epidural or Paravertebral Block Placement

- Enoxaparin will not be used 12 hours prior to epidural or paravertebral block placement, while the catheter is indwelling, or for 4 hours after removal.
- Subcutaneous heparin 5000 units q8h and sequential compression devices (SCDs) may be substituted for enoxaparin during the indwelling time.

V. **LMW Heparin (Anti-Xa) Level Monitoring**

A. A LMW Heparin level should be drawn in patients with the following characteristics:

a. Burn ≥20% TBSA
b. Weight <50 kg or ≥90 kg
c. Spinal cord injury with paraplegia, quadriplegia
d. Patients with concomitant trauma meeting criteria per trauma division's Guideline
e. Renal dysfunction (SCr increased >50% from baseline or CrCl <30 mL/min)

B. LMW Heparin (Anti-Xa) level peaks should be drawn 4 hours after the administration of the third dose of enoxaparin.

a. To order in Epic: LMW Heparin Level (must time correctly)
b. Goal peak is 0.2 to 0.4 IU/mL.
    - If LMW Heparin level is drawn appropriately and below the goal range, increase the dose to the next syringe size.
    - If LMW Heparin level is drawn appropriately and above goal range, decrease to the next syringe size. Doses other than standard syringe sizes should not be ordered.
        - If already at 30 mg Q12 hr, reduce to 30 or 40 mg q 24h.
        - If anti-Xa level remains above goal range despite changing to q24h dosing, then change to subcutaneous heparin.
c. Once the goal range is reached, no further monitoring needed. Consider rechecking LMW Heparin level every 2 weeks in patients on longer durations of therapy or sooner if significant changes in renal function occur.

VI. **Surveillance**

A. Routine lower extremity duplex ultrasound should be completed 72 hours after admission and weekly thereafter in patients who are in the very high-risk factor group

VII. **IVC Filter Placement**

A. A prophylactic IVC filter may be considered in high risk burn patients with a contraindication, failure, or complications of anticoagulation
B. Indications for a therapeutic IVC filter include patients with a known PE or lower extremity DVT and a contraindication, failure, or complication of anticoagulation, among other indications.
C. Placement of IVC filter does not prevent PEs but prevents large clots from traveling from lower extremities. Once patients are stable, they will still require anticoagulation as long as the filter is in place.

VIII. **References**

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