Practice Management Guidelines for Venous Thromboembolism Prophylaxis
Division of Trauma and Surgical Critical Care

I. **Purpose**
To prevent pulmonary embolism (PE) and deep vein thrombosis (DVT) in trauma patients

II. **Risk factors**
A. Age > 40
B. ISS > 9
C. Blood transfusion
D. Surgical procedure within 72 hours
E. Lower extremity fracture
F. Pelvic fracture
G. Immobilization
H. PMH of venous thromboembolism (VTE)
I. Malignancy
J. Extensive soft tissue trauma

III. **High risk factors**
A. Age > 50
B. ISS > 16
C. AIS ≥ 3 (any region)
D. GCS < 9
E. Pelvic fracture with associated long bone fracture
F. Major venous injury

IV. **Very High Risk Factors**
A. Spinal Cord Injury
B. AIS (head and neck) ≥ 3 & long bone fracture (upper or lower)
C. Severe pelvic fracture (post elements), and long bone fracture (upper or lower)
D. Multiple (≥ 3) long bone fractures

V. **Physical Exam Findings**
A. PE- tachycardia, tachypnea, MS changes, diaphoresis
B. DVT- extremity pain, fever, localized edema/swelling, warmth/erythema

VI. **Lab and Radiology Findings**
A. Blood gas – respiratory alkalosis, hypoxemia
B. CXR – nonspecific, peripheral wedge defect
C. Extremity Duplex – occlusive/non-occlusive thrombosis
D. CT angio Chest – filling defect(s)
VII. **VTE Prophylaxis Protocol for Trauma Patients**

A. All trauma patients, unless otherwise specified, should receive VTE prophylaxis with enoxaparin (Lovenox) 30 mg SQ Q 12 hr within 24 hrs of admission.

B. VTE prophylaxis will be initiated post-operatively after orthopedic procedures, including major pelvic procedures. If the patient is already receiving enoxaparin, the dose will be held the morning of surgery (last enoxaparin dose at least 12 hrs pre-op).

VIII. **Exceptions to VTE Prophylaxis Protocol**

**Traumatic brain and spinal cord injury**

C. VTE prophylaxis will be initiated **72 hrs after the injury/procedure** for most intracranial hemorrhages and after craniotomy.

D. Prophylaxis may be considered 24 hrs after a stable repeat head CT scan for patients with mild TBI and the following:
   
   a. GCS of 15 within 30 minutes of injury
   b. Subdural or epidural hematoma < 8 mm
   c. Contusion or intraventricular hemorrhage < 2 cm (single lobe only)

E. For patients requiring operative intervention following spinal cord injury, VTE prophylaxis should be held the morning of surgery and **may be resumed 24 hrs post-operatively** unless otherwise specified by the operating team.

F. Enoxaparin is preferred in these patient populations, as well. However, patients with one of the above conditions and an ICP monitor or spinal drain in place should receive heparin 5000 units Q 8 hrs. After removal of the ICP monitor or drain, patients should be changed to enoxaparin 30 mg Q 12 hrs.

**Epidural Placement**

G. Enoxaparin will not be used 12 hours prior to epidural placement, while the catheter is indwelling, or for 24 hours after removal.
   
   a. Heparin 5000 units Q 8 hrs and SCDs may be substituted for enoxaparin during the indwelling time.

**Renal Impairment**

H. 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 Q 8 hrs may substituted for enoxaparin.
   
   a. In patients on renal replacement therapy, heparin 5000 units Q 8 hrs is recommended over enoxaparin.

**Obesity**

I. For patients with high-risk factors for VTE and with a BMI ≥ 40 kg/m², enoxaparin should be increased to 40 mg Q 12 hrs.

IX. **IVC Filter Placement**

A. Refer to IVC filter protocol (see Procedures Section at [http://www.traumaburn.com/mdprotocolstyle.htm](http://www.traumaburn.com/mdprotocolstyle.htm))
   
   a. A prophylactic IVC filter may be considered in patients with paraplegia or quadriplegia; IVC, iliac, or femoral venous ligation/repair; severe pelvic fracture
with lower extremity long bone fracture; AIS head ≥ 3 with contraindication to anticoagulation; or high risk patients with contraindication, failure, or complications of anticoagulation.

b. Indications for a therapeutic IVC filter include patients with known PE or lower extremity DVT and contraindication, failure, or complication of anticoagulation, among other indications.

References:


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