Venous Thromboembolism (VTE) Prophylaxis Inpatient Clinical Guideline
Central Region / Intermountain Medical Center / Trauma Services

Purpose
Trauma patients are at high risk for venous thromboembolism (VTE) if they do not receive adequate chemoprophylaxis. The occurrence of deep vein thrombosis (DVT) and pulmonary embolism (PE) following trauma is well established.

Scope
All patients admitted to the Intermountain Medical Center Trauma Service.

Definitions
BID – Twice a day
BMI – Body mass index
DOAC - Direct oral anticoagulant
DUS - Duplex ultrasound
IVC – Inferior vena cava
LOC – Loss of consciousness
PO – By mouth (orally)
SCDs - Sequential compression devices
SCI – Spinal cord injury
SQ – Subcutaneous
TBI – Traumatic brain injury
TID – Three times a day

Primary Sources
None

Secondary Materials


Review and Approval Summary

<table>
<thead>
<tr>
<th>Original Approval Date:</th>
<th>January 2002</th>
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<tbody>
<tr>
<td>Effective Date:</td>
<td>January 2002; February 2017</td>
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Venous Thromboembolism Prophylaxis for Hospitalized Trauma Patients
Utilizing the Risk Assessment Profile (RAP) Score

LOW VTE RISK
(RAP Score <5)

- Place SCDs
- No chemoprophylaxis
- Early ambulation

HIGH VTE RISK
(RAP Score >5)

- Place SCDs
- Early ambulation

Contraindication to prophylaxis?

- Start chemoprophylaxis (Table 1) on admission
- Place SCDs
- Early ambulation

- Place SCDs
- Begin chemoprophylaxis (Table 1) when safe
- If no chemoprophylaxis for >48 hours from admission, perform screening BLE DUS on days 1, 3, 7, then weekly
  - Discontinue screening DUS 12 hours after chemoprophylaxis initiation
- Consider IVC filter placement

Table 1: Chemoprophylaxis Options
- Enoxaparin 30 mg SQ BID
- Enoxaparin 0.5 mg/kg SQ BID if obese (BMI>30 kg/m²)
- Heparin 5,000 units SQ TID if creatinine clearance <30 mL/min or if epidural catheter in place
- Rivaroxaban 10 mg PO daily if DOAC not contraindicated
- Apixaban 2.5 mg PO BID if DOAC not contraindicated

Table 2: Relative Contraindications to Chemoprophylaxis
- Intracranial hemorrhage (see separate protocol)
- Incomplete SCI or paraspinal hematoma at discretion of spine surgeon
- Abdominal solid organ injury at discretion of trauma surgeon
- Ocular injury
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Key Words

SCDs = sequential compression devices    VTE = venous thromboembolism
BLE DUS = bilateral extremity duplex ultrasound    IVC = inferior vena cava
RAP = risk assessment profile    SCI = spinal cord injury

Risk Assessment Profile Score

• Utilized to stratify trauma patients into categories of risk for VTE
• RAP score of ≥5 has been used in the literature to delineate “high risk” for VTE, and thus warrants in-hospital chemoprophylaxis, if safe
• See Figure 1 below, including examples of what injuries constitute the Abbreviated Injury Scale (AIS) score

Figure 1: RAP Score

<table>
<thead>
<tr>
<th>Variable</th>
<th>Points</th>
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<tbody>
<tr>
<td>Underlying condition</td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>2</td>
</tr>
<tr>
<td>Malignancy</td>
<td>2</td>
</tr>
<tr>
<td>Abnormal coagulation</td>
<td>2</td>
</tr>
<tr>
<td>History of thromboembolism</td>
<td>3</td>
</tr>
<tr>
<td>Iatrogenic factors</td>
<td></td>
</tr>
<tr>
<td>Central femoral line &gt;24 h</td>
<td>2</td>
</tr>
<tr>
<td>Transfusion, more than 4 units in 24 h</td>
<td>2</td>
</tr>
<tr>
<td>Surgery, &gt;2 h</td>
<td>2</td>
</tr>
<tr>
<td>Repair or ligation of major vascular injury</td>
<td>3</td>
</tr>
<tr>
<td>Injury-related factors</td>
<td></td>
</tr>
<tr>
<td>Chest AIS, &gt;2</td>
<td>2</td>
</tr>
<tr>
<td>Abdomen AIS, &gt;2</td>
<td>2</td>
</tr>
<tr>
<td>Head AIS, &gt;2</td>
<td>2</td>
</tr>
<tr>
<td>Spinal fractures</td>
<td>3</td>
</tr>
<tr>
<td>GCS &lt;8 for &gt;4 h</td>
<td>3</td>
</tr>
<tr>
<td>Complex lower extremity fracture</td>
<td>4</td>
</tr>
<tr>
<td>Pelvic fracture</td>
<td>4</td>
</tr>
<tr>
<td>Spinal cord injury, paraplegia or quadriplegia</td>
<td>4</td>
</tr>
</tbody>
</table>

| Age (y)                            |        |
| ≥40 but <60                        | 2      |
| ≥60 but <75                        | 3      |
| ≥75                                | 4      |

AIS = abbreviated injury scale; GCS = Glasgow Coma Scale; RAP = Risk Assessment Profile.

Table 1: RAP score risk factors and point allotment
Abbreviated Injury Scale (AIS): scoring examples
*Any AIS score >2 gets points for the RAP score

_Chest AIS_
- 2 points: simple rib or sternal fracture, displaced clavicle fracture, scapula fracture, full thickness laceration/penetrating chest wall injury
- 3 points: multiple adjacent rib fractures, hemothorax, pneumothorax, pulmonary contusion
- 4 points: rib fractures with flail segment

_Abdomen AIS_
- 2 points: grade 2 splenic/liver/renal laceration,
- 3 points: diaphragm laceration, grade 3 splenic/liver/renal laceration, penetrating injury to stomach/small bowel/colon, abdominal vascular injury, partial urethral tear
- 4 points: grade 4 splenic/liver/renal laceration, devascularized bowel, bladder rupture, complete urethral tear
- 5 points: aortic tear

_Head/Neck AIS_
- 2 points: complex facial lac, nondisplaced skull/facial fracture
- 3 points: cervical spine fracture, mild TBI with +LOC
- 5 points: intracranial hemorrhage of any kind