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 Applicability Tennessee
 Hospitals ONLY

DVT/Venous Thromboembolism Practice Management Guideline

1. Process/Procedure Description

The Deep Vein Thrombosis (DVT)/Venous Thromboembolism (VTE) Guideline provides a standardized plan of care for the prevention of VTE in the trauma patient. This guideline was developed in addition to the general hospital policy to address the complexities of managing patients with multiple traumatic injuries.

2. Who Should Read This Process/Procedure?

All patients admitted to the Trauma Service at Erlanger Medical Center.

3. Process/Procedure

Step:	Process Instructions/Description:
A.	Background VTE, inclusive of both DVT and pulmonary embolus (PE), is a common cause of morbidity and mortality in hospitalized patients. The overall annual incidence of VTE is approximately 143 per 100,000 person years. In 2011, 2.4% of all hospitalized patients were diagnosed with VTE. The approximate 30-day mortality risk for DVT and PE is 5% and 13%, respectively. In the United States, up to 100,000 patients per year die from PE. While the reported incidence of VTE in the literature for trauma patients varies widely, 5-50%, these patients have multiple interrelated risk factors that deserve special consideration.
B.	DVT risk factors Age > 40 years

	• GCS < 8 • Spinal cord Injury • Spine fractures • Pelvic fracture • Long-bone fracture • Obesity (BMI >40) • Surgical procedure > 2 hours • Femoral vein access • ≥ 4 PRBCs in first 24 hours • History of VTE • Malignancy
C.	Indications and Management for Prophylactic Anticoagulation • VTE prophylaxis should be initiated 24-48 hours after a stable follow up brain CT depending on severity of injury. • Patients with unstable spinal fractures or spinal epidural hematomas should have prophylactic anticoagulation held until cleared by neurosurgery. • VTE prophylaxis should start within 24 hours for patients with spinal fractures that are non-operative and without a spinal cord injury. • VTE prophylaxis should be initiated for stabilized spinal fractures by postoperative day 2. Limited exceptions would include: ◦ Plan for staged surgery ◦ High drain outputs (>70 ml per shift) ◦ Concomitant severe traumatic brain injury with need for intracranial pressure monitor placement. • Patients with grade IV-V liver injury, grade I–V splenic injury or pelvic fractures with moderate to large pelvic hematomas, should be started on prophylactic anticoagulation within 24-48 hours or when their hemoglobin/hematocrit is stable. • Patients to whom these contraindications do not pertain should begin prophylactic anticoagulation therapy upon admission. If there are any variances from this protocol, the reasons need to be documented in the chart. • Prophylaxis should not routinely be held prior to or following surgery without an order and this indication applies specifically to Orthopedic Surgery.
D.	Prophylaxis regimens 1. Low Molecular Weight Heparin (LMWH)-Enoxaparin is preferred formulary agent.

Enoxaparin Dosing-VTE prophylaxis in trauma patients		
	CrCl >30 mL/min	CrCl ≤30 mL/min
Patient weight <100 kg	30 mg SubQ Q 12 hrs	30 mg SubQ Q 24 hrs
Patient weight ≥100 kg	40 mg SubQ Q 12 hrs	40 mg SubQ Q 24 hrs

*May consider Enoxaparin 30 mg SubQ Q 24 hrs in patients ≤45 kg-must write "Pharmacy do not adjust dose" in medication order

2. Unfractionated Heparin (UH) - Typically only utilized in trauma patients for VTE prophylaxis if patient has renal insufficiency or is undergoing renal replacement therapy. Patients on SubQ heparin at home need monthly platelet monitoring for heparin induced thrombocytopenia (HIT).

Patient BMI	Heparin Dose
<40	5000 units SubQ Q 8 hrs
≥40	7500 units SubQ Q 8 hrs

3. Aspirin may be considered as an acceptable alternative to LMWH for DVT prophylaxis at time of discharge.

4. All non-weight-bearing patients require SCDs. Patients in skeletal traction or external fixators can use SCDs or A-V Impulse Foot pump on the affected extremity.

E. Indications for lower extremity screening venous duplex:
1. Immobile > 2 weeks with age > 55, repeat every 2 weeks while immobile

F. DVT or PE Treatment

1. Unless the thrombus is mobile/free-floating patients should NOT be placed on bedrest following the diagnosis of DVT nor should SCDs be removed.
2. Mechanical prophylaxis may be resumed by MD order once patient is appropriately anticoagulated.
3. **Patients will be treated in accordance to the 2016 CHEST Guidelines for Antithrombotic Therapy for VTE Disease while also considering risk of bleeding, need for urgent reversal, need for repeat surgical procedures resulting in interruptions of therapy, and patient comorbidities (weight, renal function, and enteral access).**
4. Treatment duration for DVT and PE is 3 months. Patients should be reevaluated after 3 months for the need to continue anticoagulation. When therapy is near completion a follow-up venous duplex exam should be documented to demonstrate resolution of the thrombus.
5. Patients within 12 days of a cerebral contusion, EDH or SDH requiring full anticoagulation should be monitored in the ICU during heparin bridging.
 - Heparin should be titrated to low-dose therapeutic range (PTT goal of 40-60). Initiation boluses should not be utilized.
 - A repeat CT of the head should be obtained when therapeutic PTT is reached or 24 hours after initiation (whichever is sooner).
6. Unless patients with afib are at high risk for thromboembolic events, their anticoagulation

should be held for two weeks.

7. Please refer to time line below when determining Length of ICU care. Major risk of bleed progression occurs until 10-12 days after the initial TBI/brain bleed.

Trauma and transfusion

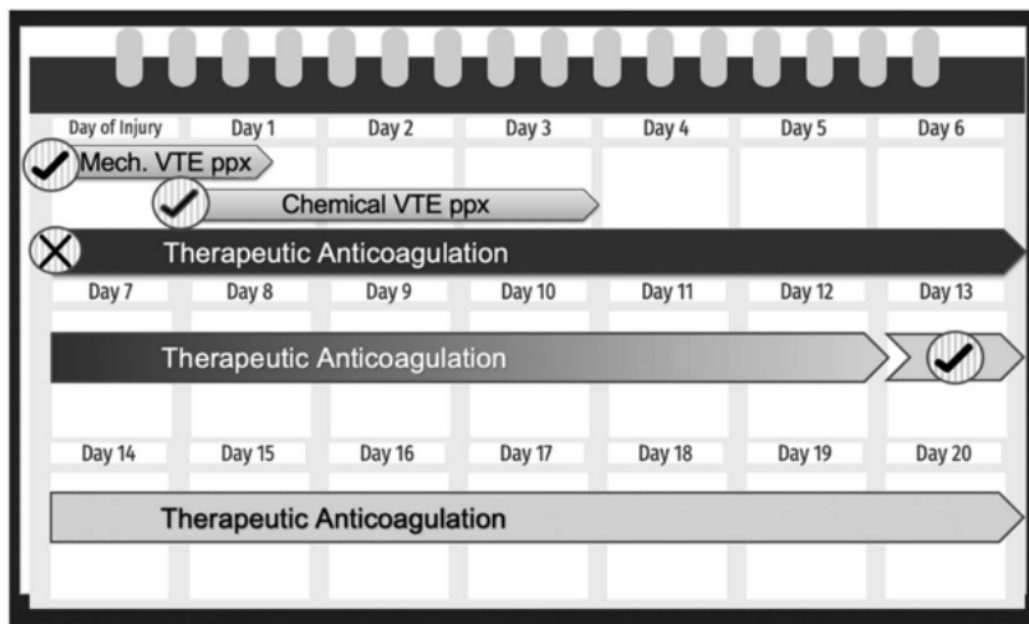


FIGURE 2. Therapeutic anticoagulation timing following TBI (Gray: safe to start VTE; Black: unsafe to start VTE). TBI, traumatic brain injury; VTE, venous thromboembolism.

- G. Heparin Induced Thrombocytopenia (HIT)
- Hospitalized patients on UH or LMWH should have a platelet level checked at baseline and every 48-72 hrs for the first 2 weeks of therapy to monitor for heparin induced thrombocytopenia (HIT). When platelets fall below 100K or to half of baseline levels, then patients may be at risk for HIT. If concern for HIT, calculate a 4T score.

Thrombocytopenia	• Platelet count fall >50% and nadir $\geq 20,000$-2 points • Platelet count fall 30-50% or nadir 10-19,000-1 point • Platelet count fall <30 % or nadir <10,000-0 points
Timing of platelet count fall	• Clear onset between days 5 and 10 or platelet count fall at ≤ 1 day if prior heparin exposure within the last 30 days-2 points • Consistent w/ fall at 5 to 10 days but unclear, onset after day 10, or fall ≤ 1 day with prior heparin exposure within 30-100 days-1 point • Platelet count fall at <4 days without recent exposure-0 points
Thrombosis or other sequelae	• Confirmed new thrombosis, skin necrosis, or acute systemic reaction after intravenous UFH bolus-2 points • Progressive or recurrent thrombosis, non-necrotizing skin lesions, or suspected thrombosis that has not been proven-1 point • None-0 points
Other causes for thrombocytopenia	• None apparent-2 points • Possible-1 point • Definite-0 points

2. 4T Score Interpretation

4T Score	Probability of HIT	Action
0-3 points	Low	No need for serologic testing or discontinuation of heparin. If clinical suspicion of HIT remains high may consider action below.
4-5 points	Intermediate	Discontinue all heparin products, add heparin as an allergy in EPIC, and follow Argatroban/HIT order set (#2287) for treatment, consult pharmacy anticoagulation service for HIT management
6-8 points	High	

3. Patients with documented heparin allergy may receive VTE prophylaxis with Arixtra (fondaparinux) 2.5 mg SubQ daily. It is contraindicated in patients with CrCl<30 mL/min.

H. IVC filter

Considerations for IVC filter placement include the following:

- Acute VTE and inability to anticoagulate
- Anticoagulation failure
- Mobile/Free-floating thrombus
- Iliac or caval DVT

References:

Kearnon, C., Ali E., Ornelas, J., (2016). Antithrombotic Therapy for VTE Disease

CHEST Guideline and Expert Panel Report. Retrieved from <http://www.chestnet.org/Guidelines-and-Resources/Guidelines-and-Consensus-Statements/CHEST-Guidelines>. 2016; 149 (2): 315-352.

Nyquist, P., Bautista, C., Jichici, D. (2016). Prophylaxis of Venous Thrombosis in Neurocritical Care Patients: An Evidence-Based Guideline: A Statement for Healthcare Professionals from the Neurocritical Care Society. Neurocritical Care Society. 24:47-60. DOI 10.1007/s12028-015-0221-y.

Rogers, F., Cipolle, M., Velmahos, G., Practice management guidelines for the management of venous thromboembolism in trauma patients. EAST Practice Parameter Workgroup for DVT Prophylaxis. Retrieved from <https://www.east.org>

Ng IC, Barnes C, Biswas S et al. When is it safe to resume anticoagulation after traumatic brain injury? Current Opin Anesthesiol 2022; 35: 166-171

Matsushimank, Leichtle SW, Wild J. Anticoagulation in patients with traumatic brain injury: An Eastern Association for the Surgery of Trauma multicenter prospective study. Surgery 2021; 169: 470-476.

European Society of Cardiology. Management of therapeutic anticoagulation in patients with intracerebral hemorrhage and mechanical heart valves. Our Heart J 2018; 39: 1709-1723.

Attachments

[📎 Anticoagulation - ICH Pts with Mechanical Heart Valve.pdf](#)

[📎 DVT Venous Thromboembolism Practice Management Guideline Algorithm.pdf](#)

Approval Signatures

Step Description	Approver	Date
VP Approval	Jessica Holladay: VP & ACNO Surg & Trauma Svcs	03/2025
Trauma Services Committee Approval	Stephanie Spain: Trauma Prgm Mgr Adult	02/2025
	Stephanie Spain: Trauma Prgm Mgr Adult	02/2025

Applicability

Erlanger Health - Baroness, Erlanger Health - Bledsoe, Erlanger Health - Children's, Erlanger Health - East,
Erlanger Health - North, Erlanger Health - System

COPY

Venous Thromboembolism Guideline

7315.202

All Trauma Patients

BLE SCDs, or foot pumps if
patient has knee immobilizer or
splint across the knee

**DVT
Screening**

Long bone fx, pelvic fx, T/L fracture
requiring surgery, SCI, immobility, or if
chemical anticoagulation has been
interrupted by more than one dose.

**23-hour Observation- No
Treatment**

Prophylaxis

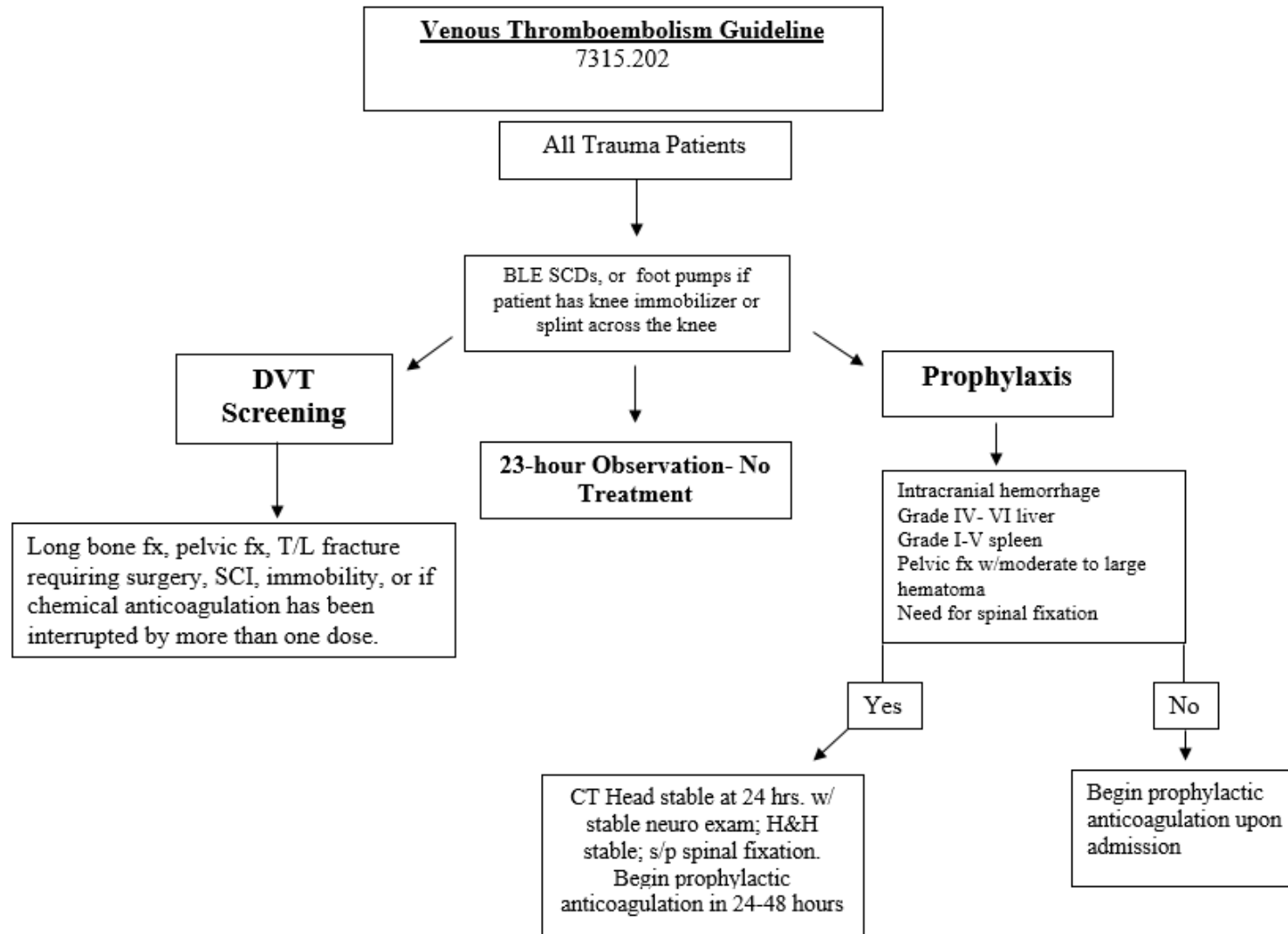
Intracranial hemorrhage
Grade IV- VI liver
Grade I-V spleen
Pelvic fx w/moderate to large
hematoma
Need for spinal fixation

Yes

CT Head stable at 24 hrs. w/
stable neuro exam; H&H
stable; s/p spinal fixation.
Begin prophylactic
anticoagulation in 24-48 hours

No

Begin prophylactic
anticoagulation upon
admission



DVT/PE Treatment for Trauma Services

**This algorithm should not be used for anticoagulation choice/dosing for Afib*

